Aalto University
School of Business

Directors' and officers' liability insurance and acquirer returns

Finance

Master's thesis

Petri Lehtonen

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OBJECTIVES OF THE STUDY

In this thesis, I study the impact of directors' & officers' liability insurance (D&O insurance) on acquirer abnormal announcement returns. My first objective is to replicate results in the prior literature of the relation between D&O insurance coverage and acquirer returns using firms listed only in Canada. I then study the possible effect of cross-listing in the US to the results. The second objective of my research is to study whether D&O insurance premium can be used as a proxy for corporate governance quality and to compare its explanatory power of acquirer returns to two corporate governance indexes, The Globe and Mail Governance Index and Board Shareholder Confidence Index.

DATA AND METHODOLOGY

My sample consists of 2,238 completed acquisitions between 2003 and 2013. Firms listed only in Canada made 1,602 of these acquisitions and firms cross-listed in the US made 636 of them. D&O insurance and corporate governance indexes data are unique as they are hand-collected. My analysis is based on univariate and multivariate regression models (ordinary least regression, OLS). In the regressions I use 5-day cumulative abnormal announcement return as dependent variable, and D&O insurance variables and two corporate governance indexes as explanatory variables. I control for deal and acquirer characteristics, deal types, and year and industry fixed-effects.

FINDINGS OF THE STUDY

First, I find significant negative relation between D&O insurance coverage and cumulative acquirer announcement returns with sample firms listed only in Canada. The negative relation is in line with the prior literature. However, acquirer returns become positive when a firm is cross-listed in the US, indicating that higher D&O insurance protection can be beneficial for shareholders of firms operating in the US market. Thus, my results suggest that the effect of D&O insurance variables on acquirer returns varies in different markets. Second, I find significant negative relation between D&O insurance premium and acquirer returns, indicating that insurance companies can price the risk related to corporate governance structures. Furthermore, I do not find significant relation between the two corporate governance indexes and acquirer returns, which supports the idea that D&O insurance premium includes valuable information not otherwise available in the market.

Keywords acquisition, D&O insurance, insurance coverage, insurance premium, corporate governance index, cumulative abnormal announcement return, cross-listing

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TUTKIELMAN TAVOITTEET

Tutkin pro gradu -tutkielmassani yrityksen hallintoelinten vastuuvakuutuksen vaikutusta yrityskauppojen ympärillä esiintyviin kumulatiivisiin epänormaaleihin osaketuottoihin. Tutkimukseni ensimmäinen tavoite on toistaa aiemmin saavutetut tulokset vastuuvakuutuksen vakuutusmäärän ja yrityskauppojen tuottojen välillä käyttäen kanadalaisia yrityksiä. Sen jälkeen selvitän, vaikuttaako yrityksen listautuminen yhdysvaltalaiseen osakepörssiin tuloksiin. Tutkimukseni toinen tavoite on kokeilla voiko yrityksen maksamaa hallintoelinten vastuuvakuutuksen hintaa käyttää mittarina yhtiön hallinnoinnin laadukkuudelle ja verrata sen selitysvoimaa yrityskauppojen tuotoille kahteen hallinnoinnin laadukkuutta mittaavaan indeksiin.

DATA JA METODOLOGIA

Otokseni koostuu 2.238 yrityskaupasta, jotka on tehty vuosien 2003 ja 2013 välillä. Näistä kaupoista 1.602 kappaletta on ainoastaan Kanadassa listattujen yritysten tekemiä ja 636 kauppaa sellaisten yritysten tekemiä, jotka on listattu pörssiin myös Yhdysvalloissa. Sekä vakuutus- että hallinnointi-indeksidata on käsin kerättyä ja siksi ainutlaatuista. Analyysini perustuu yhden ja usean muuttujan regressioon (pienimmän neliösumman menetelmä, PNS). Regressioissa selitettävinä muuttujina ovat yrityskaupan julkaisun ympärille lasketut viiden päivän epänormaalit kumulatiiviset osaketuotot sekä yrityskaupan preemio. Selittävinä muuttujina ovat vakuutuksen esiintyminen, vakuutusmäärä ja -preemio sekä kaksi hallinnointi-indeksiä. Kontrolleina ovat kauppa- ja yrityskohtaisia muuttujia sekä kiinteinä vaikutuksina kaupantekovuosi ja yrityksen toimiala.

TULOKSET

Vain Kanadassa listatut yritykset kokevat negatiivisia osaketuottoja yrityskaupan ympärillä, kun niiden hallintoelinten vastuuvakuutusmäärä kasvaa. Tulos on linjassa aiemmin aiheesta tehtyjen tutkimusten kanssa. Toisaalta yritykset, jotka ovat listattu pörssiin myös Yhdysvalloissa, kokevat positiivisia tuottoja niiden vastuuvakuutusmäärän kasvaessa. Lisäksi vastuuvakuutuksen hinta korreloi negatiivisesti osaketuottojen kanssa, mutta vertailuindeksien ja tuottojen välistä korrelaatiota ei ole. Tämä viittaa siihen, että vakuutusyhtiöt kykenevät hinnoittelemaan hallinnointirakenteiden riskit siten, että hinta sisältää ainutlaatuista tietoa yrityksen hallinnointirakenteista, jota ei muuten ole markkinoilla saatavilla.

Avainsanat yrityskauppa, hallintoelinten vastuuvakuutus, vakuutusmäärä, vakuutuspreemio, hallinnointi-indeksi, kumulatiivinen epänormaali osaketuotto, ristiinlistautuminen

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1. Introduction

> "What you're really underwriting when you underwrite D&O is you're underwriting the people. You're underwriting the senior management, the quality of the management team." ― D&O broker, Baker and Griffith (2007)

Directors and officers are responsible for the firm's actions with their personal assets in the event of a lawsuit against the firm and its management. They can protect themselves from these liabilities by having the corporation to purchase a directors' and officers' liability insurance (hereafter referred to as D&O insurance). Many studies have found evidence that the protection provided by the D&O insurance can affect the management's decisions and thus the D&O insurance information can be valuable in evaluating the effectiveness of corporate governance structures and maximizing returns to outside shareholders. Furthermore, D&O insurers go deep in the governance structures of their clients in the underwriting process, and recent studies have found evidence that the pricing of the firm's D&O insurance can include information on the quality of governance structures that is not otherwise publicly available. As stated in the quote above, D&O insurance underwriting is a process of evaluating the quality of the firm management.

The relationship between stockholders and management is the basic example of the traditional principal-agent relationship. As it is always the case with a principal-agent relationship, it is not possible to completely eliminate the conflict of interest between directors and stockholders. The director is acting as the agent for the shareholders and is supposed to make decisions that will maximize shareholder wealth. However, it is in the director's own best interest to maximize his own wealth. D&O insurance decision can affect the shareholder-director relationship by motivating the director to act either more or less in the best interest of stockholders. Whether the D&O insurance is beneficial for the stockholders or not is an empirical question.

D&O insurance information is publicly available only in a few countries in the world and most of the D&O insurance studies are conducted with Canadian, Taiwanese or British data. As Kang and Klausner (2011) point out, the legal environment is very litigious in the US and there has been recently loss of confidence in corporate governance resulting from the debacle of corporates like Enron, Worldcom, Adelphia, and Anderson. Today directors are facing even greater risk of lawsuits originating from shareholders. Therefore, D&O insurance can be especially important for directors of firms operating in the US market. However, firms are not required to publish their D&O insurance data in the US and thus the effects of D&O insurance on US firms are still not well known.

In this thesis, I shed light on the effect of D&O insurance in US market by using a sample of US cross-listed firms. I study D&O insurance coverage and D&O insurance premium and test their relevance on explaining acquirer returns. I look for any correlation between these two D&O insurance variables and cumulative abnormal announcement returns. With D&O insurance coverage I make comparison between firms which are listed only in the Toronto Stock Exchange (TSX) to those which are also cross-listed in one of the stock markets in the US (NYSE, Amex, or Nasdaq). Dividing my sample into cross-listed and non-cross-listed firms gives an opportunity to see the effects of the D&O insurance decision for the firms participating in the US market. Furthermore, with the sample of cross-listed firms, I use D&O insurance premium and two most commonly used Canadian corporate governance indexes as proxies for the quality of corporate governance and test their ability to explain acquirer returns.

1.1 Contribution to existing research

There has been recently a growing consensus in D&O insurance research. However, data used in most of the studies are limited to countries where firms are required to publish their D&O insurance information. Therefore, there are still many interesting market areas, especially the US, where the effects of D&O insurance are still not well known. By taking the same approach as Kang and Klausner (2011) in their study of D&O insurance and CEO overcompensation, I am using Canadian firms cross-listed in the US to get comparable results to US firms. To the best of my knowledge, using cross-listed firms is by far the most accurate way to study D&O insurance in the US market at the moment.

Thanks to the cross-listing approach, my thesis adds to the current research in several ways. It is by far the first paper to research the effects of D&O insurance coverage on acquirer returns with a sample that differentiates firms listed in the US. It is also the first paper to test successfully D&O insurance premium as a proxy for the quality of corporate governance and to make comparison between D&O insurance premium and corporate governance indexes in an acquisition event.

In addition to filling the existing research gap on the effects of D&O insurance, my research also has practical significance to legislators, outside investors, and firm management and owners. It supports the idea that legislators should require firms to disclose their D&O insurance information in countries where this piece of information is not yet publicly available, as it can be valuable for outside investors in evaluating the effectiveness of firm's governance structures. This study provides firm management and owners support for their optimal D&O insurance decision.

1.2 Key research questions

My study can be divided into two high-level categories. First, I study the relation between D&O insurance variables and acquirer returns, including the decision to purchase the insurance and the amount of coverage purchased. I also take a look at differences in M&A activity between different kinds of firms. I split the sample firms into two groups, the first one covering firms which are listed only in Canada (non-cross-listed firms), and the other covering firms which are cross-listed in the US (cross-listed firms). This leads to my first three research questions:

I. *Research question: Is there a difference in the amount of D&O insurance coverage between firms listed only in Canada and firms cross-listed in the US?*

II. *Research question: Is there a difference in M&A activity of firms with low and high D&O insurance coverage between cross-listed and non-cross-listed firms?*

III. *Research question: Is there a difference in the impact of D&O insurance coverage on acquirer returns between non-cross-listed firms and firms cross-listed in the US?*

The second high-level category of my study focuses on the D&O insurance premium and acquirer returns using the cross-listed sample. I develop a proxy from the D&O insurance premium for the quality of corporate governance and study its relation with acquirer returns. As a comparison I run the same regressions for two corporate governance indexes and see which one has the strongest explanatory power of acquirer returns.

IV. *Research question: Can D&O insurance premium explain acquirer returns and thus be used as a proxy for the quality of corporate governance?*

V. *Research question: Which one of the variables, D&O insurance premium or the two governance indexes, has the strongest explanatory power of acquirer returns?*

1.3 Findings of the study

My data set reveals differences between firms and their D&O insurance decisions based on their cross-listing status. Cross-listed firms are on average larger, they are more likely to purchase D&O insurance, and they purchase higher levels of D&O insurance coverage than firms that are non-cross-listed. In my sample 83.5% of cross-listed firms and 67% of non-cross-listed firms carry a D&O insurance policy. The average coverage for a cross-listed firm is C$84.8M and the average coverage

for a non-cross-listed firm is C$18.1M. However, in relation to firm size, non-cross-listed firms carry higher D&O insurance coverage ratios than cross-listed ones.

The first key finding of my study is that firms listed only in Canada experience significantly lower acquirer abnormal returns when they carry higher levels of D&O insurance coverage. The negative relation is in line with the prior literature. However, the relation becomes significantly positive when firms are cross-listed in the US. In the cross-listed group a one-standard-deviation higher insurance coverage ratio increases acquirer abnormal announcement returns by 1.4% and in the non-cross-listed group it decreases them by -0.7%. The positive relation between D&O insurance coverage and acquirer returns in the cross-listed group holds after controlling for deal and acquirer characteristics, deal types based on target and financing status, and year and industry fixed-effects. Furthermore, the results are robust after addressing the possible endogeneity problem by using an instrumental variable approach. The indirect evidence of this study suggests that cross-listed firms with low D&O insurance coverage make relatively fewer acquisitions than non-cross-listed firms with low coverage. Reduced M&A activity among cross-listed firms with low coverage can be an indication of an underinvestment problem.

The second key finding of my study is the significant negative relation between D&O insurance premium and acquirer returns, indicating that insurance companies can price the risk related to corporate governance structures of a firm. More specifically, a one-standard-deviation increase in the natural logarithmic transformation of per dollar D&O insurance premium reduces acquirer abnormal announcement returns by 0.9%. The negative relation between premium and acquirer returns holds after controlling for deal and acquirer characteristics, deal types based on target and financing status, and year fixed-effects. Furthermore, the results are robust after sensitivity testing by a dummy variable approach. My results also suggest that there is no significant relation between either of the two corporate governance indexes and acquirer returns. My results support the idea that D&O insurance premium includes valuable information not otherwise available in the market.

1.4 Limitations of the study

As it is with all the D&O insurance studies, the availability of insurance data is always a concern. Therefore, to get an idea of US firms the study has to be made with Canadian firms that are cross-listed in the US. It is possible that these cross-listed Canadian firms have some meaningful differences to US firms that cannot be taken into account in this study. One possible difference is in the industry structures of the two countries. For example, in Canada large mining companies account for much larger share of the total market than in the US. I address the industry composition issue by using

industry fixed-effects, which should at least reduce the effect of the differences in industry structures. Also, the number of sample firms available for the study is quite limited as they have to be cross-listed and publish their D&O insurance information in enough detail.

The other limitation of this study is in the data collecting. D&O insurance and corporate governance indexes data have to be hand-collected. As my sample includes only firms that have made acquisitions, comparing M&A activity between firms with different levels of protection can provide only indirect evidence on their acquisition decisions. There are some control variables that could be meaningful, but they would also require hand-collecting and are thus out of scope of this study. For example, including CEO experience and board characteristics could improve the explanatory power of my model. There are also some control variables that could be meaningful, such as relative deal size, but they would reduce the sample size considerably and therefore they have to be omitted from the regression model. The level of detail in the disclosure of D&O insurance information is at times relatively poor. Some firms report having the insurance on their proxy circulars, but they do not provide any other necessary information for this study.

1.5 Structure of the study

The thesis is structured as follows. Chapter 2 provides an overview of D&O insurance, corporate governance, cross-listing, and existing literature by discussing both the existing research on the topic and the D&O insurance and corporate governance on a more general level. Chapter 3 introduces my hypotheses. Chapter 4 covers data and sample selection used in this study. Chapter 5 introduces methods and the construction of variables. Chapter 6 presents the empirical results of my analysis. In chapter 7 I discuss my results and link them to my research questions. In chapter 8 I conclude the key results and suggest areas for future research.

2. Literature review

This section provides an overview on the existing literature. First, I discuss the D&O insurance in general and reasons why firms purchase the insurance. Next, I discuss what the current literature finds about D&O insurance coverage, D&O insurance premium, and cross-listing of a firm. Then I explain the relation between D&O insurance and corporate governance, and go through the meaning of D&O insurance in corporate governance studies. Finally, I bring up some problems with the current corporate governance research and corporate governance indexes.

2.1 D&O insurance in general

Directors can be sued under the corporate law for breach of acting honestly and in good faith or duty of care. They can be sued under the securities law, which is according to Donley and Kent (2008) the most significant source of risk for the directors. Both D&O insurance and corporate indemnification provide protection to directors and officers for legal liability arising from their professional activities on behalf of the firm. Indemnification is a process in which firms agree to compensate executives for the costs of defense and or settling lawsuits brought against them personally as a result of their actions in the management. Firms purchase D&O insurance to recoup these indemnification costs, or to provide protection when indemnification does not apply. According to Lin, Officer and Zou (2011), most securities class action lawsuits in the US brought by shareholders are settled out of the court within the D&O insurance coverage limit. Therefore, for a firm D&O insurance is an important source of protection for the defense and settlement of lawsuits.

In the US the importance of D&O insurance has been increasing in recent years. Surveys conducted by consulting firm Tillinghast-Towers and Perrin (2002, and 2012) highlight the change: In 2002, 19% of firms in the US had at least one lawsuit brought against their directors in the previous ten years, but their similar study in 2012 reports the share had increased to 36%. The increase in lawsuits indicates that D&O insurance claim activity is increasing and it has become a public company phenomenon. The study in 2012 also states that most of the claims against directors and officers are brought from direct shareholders (46%), derivative shareholders (40%) and employees (30%). Regulatory actions have increased their share of claims since new laws put in place due to the financial crisis, including Dodd-Frank Wall Street Reform and Consumer Protection Act. They accounted for 23% of all claims in 2012 as in comparison it was 16% in 2010. Furthermore, inquiries in the US made by directors about the amount and scope of coverage, has become more common due to the growing number of claims made against them. According to the survey made by Tillinghast-

Towers and Perrin (2012), firms have reacted to the growing number of claims by increasing their total insurance coverages at D&O program renewals. The whole marketplace for the insurance has been put into a state of transition, as evidenced by higher pricing experienced in many sectors.

According to Lin, Officer, Wang and Zou (2013), the Canadian system for handling securities class action lawsuits is similar to that in the US to a large extent. They point out that the liability risk to corporate directors and officers often comes from shareholder litigation or lawsuits brought by other parties such as creditors and regulators. According to Chalmers, Dann and Harford (2002), directors and officers consider D&O insurance to be crucial in Canada as it is in the US. For example, in Canada the costs of settlement or judgment in derivative suits are typically covered by a D&O insurance policy. However, there are some important differences between the governance systems in Canada and the US that can have an effect on whether D&O insurance protection is beneficial for the corporate shareholders or not. According to Gouiaa and Zéghal (2013), Canadian firms operate within a socio-economic environment which has many distinguishing features that can influence both the governance practices and the financing costs. In Canada firms use a specific governance system which includes strong legal and extra-legal institutions aimed at protecting investors. It is characterized by a principle-based governance approach.

2.2 Reasons why firms purchase D&O insurance

According to O'Sullivan (2002), firms purchase D&O insurance for three main reasons: (1) as a part of their corporate insurance program, (2) due to demand from directors, and (3) as part of an optimal governance arrangement:

First, for many firms D&O liability insurance is an important part of their insurance program. It covers the firm itself from the costs of lawsuit settlements caused by the actions of the management. Hazen and Hazen (2012) point out that the criticality of D&O insurance can be assessed from the fact that directors of even not-for-profit firms are advised to act in the same manner as directors of firms when D&O insurance is not available.

Second, directors are representative of the corporation and they can be personally liable for some of their actions committed in the name of the corporation. Therefore, the existence of the D&O insurance can be, according to Boyer and Delvaux-Derome (2002), a notable factor when they are deciding whether to join the firm or not. Romano (1989) points out directors are known to resign or not to come aboard in for-profit firms in absence of D&O insurance.

Third, according to Chi, Weng, Gong and Chen (2013), firms have established internal corporate governance mechanisms to encourage CEO risk taking behavior by providing D&O insurance and by awarding CEOs equity incentives. D&O insurance works also as a corporate governance mechanism due to monitoring and inspection done by the insurer. As the insurance allows executives to face lower litigation risk, it can allow them to take appropriate risks to maximize shareholder value. However, D&O liability insurance can also entrench directors because of the protection it provides them against shareholder lawsuits. Therefore, the effect of D&O insurance on shareholder wealth is an empirical question.

There are many firm specific factors that affect the decision whether to buy the D&O insurance or not. According to Boyer and Delvaux-Derome (2002), firms that are larger, have higher stock volatility, are more exposed to US litigation, exhibit lower levels of directorial ownership, and possess greater non-executive representation on their boards are more likely to purchase the insurance. Core (1997) also points out that a firm with greater inside voting control is more likely to purchase D&O liability insurance and carry higher limits. On the other hand, Boyer and Delvaux-Derome (2002) state that firms that are strong financially, have many outsiders on the board of directors or their board member have an important financial stake in the firm are less likely to purchase the insurance.

2.3 Main findings in prior literature on D&O insurance

In recent years, D&O insurance has become a more common part of insurance packages due to the tightened legal environment after many company scandals and the financial crisis. Now the actions of firm management are even more under the scope than before. Therefore, there is a growing consensus in D&O insurance research as well. These studies have found evidence that D&O insurance affects management behavior and that there is a relation between D&O insurance variables and the quality of governance structures.

Jensen's (1986) free cash flow hypothesis argues that directors realize large personal gains from empire building. Morck, Shleifer, and Vishny (1990) identify that several types of acquisitions, such as diversifying acquisitions and acquisitions of high growth targets, can yield substantial benefits to directors, while at the same time hurting shareholders. The level of D&O insurance protection can affect the incentives of the management team to make these decisions hurting shareholders. However, the effects vary between different studies. Some of the studies report that extensive D&O insurance protection leads to higher risk taking and more diversifying acquisitions due to the empire building behavior. For example, according to Lin et al. (2013), there is a positive relation between both idiosyncratic and total risk of a firm and the D&O insurance coverage in Canada. They suggest that

lenders view D&O insurance coverage as increasing credit risk associated with greater risk taking and higher probabilities of financial restatement due to aggressive financial reporting. Furthermore, Lin et al. (2011) find that D&O insurance coverage has negative relation with acquirer returns in Canada.

On the other hand, there are also studies suggesting that extensive D&O insurance protection makes shareholders better off. For example, Kalelkar and Nwaeze (2015) find that firms in the US with abnormal D&O insurance protection are positively associated with aggressive reporting, aggressive investment activity, and abnormal profit performance. However, their study is based on voluntary disclosures of D&O insurance information, which do not have standard format and reduces the sample size. Whether higher D&O insurance protection is beneficial for shareholders in the US market is still an empirical question.

According to Core (2000), there is a growing consensus inside and outside academics that weak corporate governance is costly to outside shareholders. They also state that it is difficult and costly for shareholders to assess its quality. There are studies suggesting that D&O insurance premium can be used as a proxy for evaluating governance structures. For example, Baker and Griffith (2007) report that insurers seek to price D&O policies according to the risk posed by each prospective insured and that underwriters focus on corporate governance in assessing risk. According to them, in addition to performing a basic financial analysis of the firm, underwriters focus a large part of their efforts on deep governance variables such as culture and character, rather than the formal governance structures that are typically studied.

Core (2000) states it is too costly for the insurer to just exclude all claims arising from weak corporate governance. Since the quality of governance structures varies in cross section for otherwise identical firms, the insurer prices the quality of corporate governance in D&O premiums. A firm with weaker governance has greater litigation risk because the management of such a firm is more likely to act inconsistent with shareholders' interests. Core shows a detectable variation in D&O premium that is related to variables which proxy for the quality of firms' governance. Both Core (2000) and Kang and Klausner (2011), show that the proxies for weak governance are positively associated with excess CEO compensation. Their results provide evidence that D&O insurers charge firms higher premiums when they adopt governance structures that make shareholders worse off. To the best of my knowledge, the empirical question of the possible relation between D&O insurance premiums and acquirer returns has not yet been tested.

2.4 Cross-listing in the US

Exposure to the more litigious US legal environment has been found to be a significant determinant of the D&O premium (see Core, 2000). Adoption of Sarbanes-Oxley requirements in 2002 made cross-listing in US exchanges more expensive than it was in the past and the new requirements put a heavy emphasis on corporate governance and accountability. As cross-listing can have various effects on corporate governance structures, I take firms' cross-listing in the US into account in this study.

Cross-listing can have an effect on the firm's D&O insurance purchase decision and management behavior, and also on the pricing of the D&O insurance. For example, Burns, Francis, and Hasan (2007) find that compared to firms based in the US, cross-listed firms are less likely to use equity in takeovers of US targets. They also find that cross-listing reduces barriers to investment. Furthermore, Lang, Lins, and Miller (2004) find that firms that are cross-listed in US exchanges have greater analyst coverage and increased forecast accuracy than firms that are non-cross-listed. They also show that cross-listed firms have higher valuations. They state that the change in firm value around cross listing is correlated with changes in analyst following and forecast accuracy, suggesting that cross listing enhances firm value through its effect on the firm's information environment. Their findings support the hypothesis that cross-listed firms have better information environments that are associated with higher market valuations.

In theory, it is possible that the stock prices of cross-listed firms could differ between the stock exchanges, which could have an effect on this study. However, Eun, and Sabherwal (2003) find that prices in the TSX and US exchange are cointegrated and mutually adjusting for firms listed in both countries. They state that the US share is directly related to the US share of trading and to the ratio of proportions of informative trades on the US exchange and the TSX, and inversely related to the ratio of bid-ask spreads.

2.5 Theoretical framework of corporate governance

The theoretical framework of corporate governance is based on the finance literature of the late 1970s and the legal literature of the 1980s. In 1976, Jensen and Meckling developed a theory of agency costs in the public firm, which remains the dominant framework of analysis for corporate governance today. A contractarian view of corporation emerged, in which corporation was viewed as a nexus of contracts among constituents, including directors, shareholders, creditors, employees, and others. Since then, the focus of governance has primarily been on the agency relationship between directors and shareholders. In corporate governance the contractual shareholder-director relationship means

that market forces lead the parties to create governance arrangements and adopt legal rules that would minimize agency costs and thereby maximize firm value. In the literature, contractual governance is seen as superior to legally imposed governance arrangements because firms are different along numerous dimensions and market forces create incentives to customize and to innovate.

However, Klausner (2013) states that the contractarian theory failed to take into account important institutional facts. He states that the empirical literature provides the facts needed to reassess the contractarian theory and the understanding of corporate governance in general. Also, Gillan (2006) points out that traditional empirical research of corporate governance is increasingly under attack from critiques of endogeneity. There have been calls from many researchers including Coles, Lemmon and Meschke (2012), and Zingales (2000) amongst others, to further develop structural models or quantitative theories of the firm to improve the empirical work. Klausner suggests that the study of empirical regularities and associations combined with traditional theoretical modelling and the development of structural models will pave the way forward. He states that careful modeling of transactional event, such as mergers and acquisitions, and how they relate to governance characteristics will continue to be a stable of governance research. Therefore, as D&O insurance can include additional information on firm's governance structures, it can provide a new angle for corporate governance studies.

2.6 Benchmark for D&O insurance premium: Governance indexes

To get a better idea how well D&O insurance premium can explain corporate governance quality, it needs a benchmark to make a comparison. In the literature, corporate governance indexes are typically used to evaluate the quality of corporate governance. Therefore, they are a relevant choice for the benchmark.

Some researchers (see Gompers, Ishii and Metrick, 2003; Brown and Caylor, 2006; Bebchuk, Cohel and Ferrell, 2009) consider the approach of assessing governance quality by building an index with several aspects of corporate governance to be of great importance. However, there are researchers who think the opposite. Gouiaa and Zéghal (2013) suggest that governance indexes cannot evaluate the quality of the board of directors. They conclude that governance indexes are highly imperfect and that investors and policymakers should exercise extreme caution in attempting to evaluate firm's quality or forecast future stock market performance from its ranking on any particular governance measure. Furthermore, they point out that the effect of governance indexes in financing costs is not clearly established. Bhagat and Bolton (2008) consider the specific characteristics of the board as

better determinants of the quality and the effectiveness of corporate governance. In the following paragraphs I explain briefly how governance indexes are developed.

The construction of an index requires that all variables are weighted. Currently used corporate governance indexes combine different attributes of the governance to evaluate its overall quality. Indexes vary with respect to which attributes of corporate governance are included. The first indexes were created by academics and researchers, but the stream of governance research generated commercial indexes as well. Bebchuk et al. (2009) state that commercial indexes are designed primarily for institutional investors pursuing information about the quality of corporate governance system to support portfolio decisions, and to firms that want to signal their governance quality to investors. Bhagat and Bolton (2008) suggest that the main difference between the two types of indexes is based on their expertise and their analytical approach to corporate governance.

First difference is in the weights given to governance features in the indexes. In the commercial ones features differ from one to another and from one firm to another. They are generally based on a number of governance factors which are not equally weighted. For example, the weights assigned to the components can be based on their correlations with the level of risk and past performance of the firm. Furthermore, the scores for commercial indexes and the weights of the items that compose them are also modified and updated to better reflect market trends in corporate governance. Therefore, the weighting scale of a commercial index can be significantly affected by the subjective judgment of analysts based on their experience and knowledge.

According to Bozec and Bozec (2012), commercial indexes are generally expressed in relative terms with each firm rated relative to industry or size peers. They point out that academic indicators, on the other hand, give absolute ratings of the quality of governance practices regardless of comparable firms. Thus, it is possible that the weight assigned to a particular governance feature is not consistent with those used by financial market participants in assessing the quality of corporate governance. Bhagat and Bolton (2008) suggest that inconsistency in weights can lead investors to draw incorrect inferences and conclusions from empirical studies. Furthermore, Renders, Gaeremynck, and Sercu (2010) state that in commercial indexes board characteristics are most studied while other mechanisms are not included or they are poorly weighted.

On the other hand, academic indexes include a smaller number of governance features that are targeted directly to the firms at hand. These attributes are equally weighted and take a binary value depending on the presence or absence of a governance practice. Bozec and Bozec (2012) state that

academic indexes are supposed to be less subjective than commercial o, since they are based on a simple count of the value assigned to each governance feature and they are usually expressed as absolute measures. Researchers have the opportunity to select the sample and the governance attributes that they consider relevant when they construct the indexes by themselves.

3. Hypotheses

This study tests how well two D&O insurance variables, coverage and premium, can explain acquirer returns. This section outlines the hypotheses that are tested to find answers to my research questions provided in the introduction and I also provide a brief theoretical background behind the stated hypotheses. I present results in the empirical section of this study.

3.1 D&O insurance coverage

D&O insurance coverage can have an effect on the behavior of firm directors. As the legal environment is more litigious in the US than it is in Canada, management teams of firms operating in the US market are under higher personal risk when taking care of their work. Furthermore, firms listed in two different market areas are likely to receive more analyst coverage. Therefore, directors of cross-listed firms are under higher outside control and their incentive to work against the shareholders' will to get personal benefits can be more difficult. This leads me to my first hypothesis:

H1: *Firms that are cross-listed in the US are more likely to purchase D&O insurance and they carry higher coverage limits than firms that are listed only in Canada.*

In theory higher D&O insurance protection can be either beneficial or harmful for shareholders. It can lead to destructive empire building behavior or otherwise it can correlate with abnormal profit performance. It is possible that the environment where the firm operates has an important influence on the outcome. Prior literature shows that firms listed in Canada are in general worse off when they carry higher limits of D&O insurance coverage. However, the legal environment is more litigious in the US and therefore high liability exposure can cause under-investment problems by inducing directors to be overly conservative and can cause them to forgo risky positive-NPV projects. If that was the case, M&A activity of firms with low D&O insurance coverage should be lower than the M&A activity of firms with high D&O insurance protection. This leads to my second hypothesis:

H2: *M&A activity of firms with low D&O insurance coverage is relatively lower if firms are cross-listed comparing to non-cross-listed firms.*

If that was the case, it is possible that cross-listed firms with higher D&O insurance coverage follow more optimal investment strategy that leads to higher acquirer returns than firms with low coverage. My next hypothesis is based on the idea that the underinvestment problem among firms with low D&O insurance coverage is more sever among cross-listed firms than non-cross-listed firms as they are operating under US legislation:

H3: *D&O insurance coverage has negative effect on acquirer returns, but the effect becomes positive when the firm is cross-listed in the US.*

3.2 D&O insurance premium

According to Kang and Klausner (2011), D&O insurance premium contains information valuable to capital market participants. Core (2000) suggests that D&O insurance premium can be hypothesized to be a function of the quality of corporate governance and its business risk:

$$D\&O\ insurance\ premium\ =\ f(governance\ quality, business\ risk) \qquad (1)$$

Core states that governance structure quality and business risk, such as firm size and profitability, increases litigation risk. As low quality governance structures can be expected to increase firm's D&O insurance premium, higher D&O insurance premium should lead to worse acquirer returns. This leads to my fourth hypothesis:

H4: *D&O insurance premium has a negative relation with acquirer returns.*

According to Kang and Klausner (2011), disclosure of D&O insurance information can provide useful supplemental information on governance quality due to underwriters' unique access to non-public information of non-disclosure agreements. As most firms purchase the D&O insurance, the information signaled through the disclosure of D&O insurance details can be the only reliable third-party assessment of governance quality for firms that don't receive any analyst coverage at all. The assumption that this piece of information is not otherwise publicly available lead to my fifth hypothesis:

H5: *Due to unique information contained in D&O insurance premium, it has higher explanatory power of acquirer returns than corporate governance indexes implicating that it works better as a proxy for the quality of corporate governance than the indexes.*

4. Data and sample selection

The initial sample consists of 2,238 acquisitions made by publicly traded firms listed in the TSX during the time period between 2003 and 2013. TSX is the largest stock exchange in Canada and represents a broad range of businesses from Canada, the US, and Europe. The reason why I use Canadian data is that D&O insurance data are publicly available there, unlike in the US. However, according to Core (2000), the more litigious US legal environment has been found to be significant determinant of the D&O decision. To study the effects of D&O insurance on firms operating in the US market, I divide the data into two subgroups: cross-listed firms and non-cross-listed firms based on their possible listing on one of the US stock exchanges (NYSE, Amex, or Nasdaq). Cross-listing and exposure to US securities litigation risk makes the sample firms close proxies for US firms. Dividing the data allows me to make comparison between firms operating in Canadian and the US market. The group of cross-listed firms consists of 636 completed acquisitions and the group of non-cross-listed firms consists of 1,602 completed acquisitions.

I extract my acquisition sample from the Securities Data Corporation (SDC) Mergers and Acquisitions database. The acquisitions that meet the following criteria are included in the sample:

1. The acquisition is completed.
2. The acquirer has D&O insurance information data (insurance coverage, insurance period, and insurance premium) from the System for Electronic Document Analysis and Retrieval (SEDAR).
3. For the D&O insurance premium analysis, the acquirer has governance index data from Globe and Mail (GMI index) and Board Shareholder Confidence Index (BSCI index).
4. The acquirer has annual financial statement information available and stock return data (210 trading days prior to acquisition announcements) from Datastream.

Table 1 presents the distribution of the sample of acquisitions by announcement year: Panel A consists of cross-listed firms and Panel B consists of firms that are only listed in the TSX. The distribution for the whole sample is in Appendix B. The larger sample size of non-cross-listed firms is due to their larger share in the TSX. Table 1 shows that the number of acquisitions per year is quite uniform for both groups during the sample period. The mean acquirer market value of equity and the mean deal value are greatly larger for the cross-listed groups than for the non-cross-listed group. On the other hand, mean relative deal size is over two times larger for the non-cross-listed group than for the cross-listed group.

Table 1: Acquisitions by announcement year

The sample consists of 2,238 completed acquisitions made by firms that were listed in the Toronto Stock Exchange between 2003 and 2013, subject to the availability of D&O insurance and stock price information. Panel A consists of 636 acquisitions that were made by firms that were cross-listed in one of the US stock exchanges (NYSE, Amex, or Nasdaq). Panel B consists of 1,602 acquisitions that were made by firms that were listed only in the Toronto Stock Exchange at the announcement date. The numbers in parentheses are medians. C$mm is millions of Canadian dollars. Absolute dollar values are expressed in real terms (2003 Canadian dollars) and calculated using the Bank of Canada inflation calculator. Relative size is defined in Appendix A.

Panel A: Cross-listed firms

Year	No. of acquisitions	Percentage of sample	Mean acquirer market value of equity (C$mm) [Median]	Mean deal value [Median]	Mean relative deal size [Median]
2003	55	8.6	2,621	161	0.27
			[581]	[93]	[0.05]
2004	59	9.3	2,249	272	0.31
			[447]	[95]	[0.10]
2005	56	8.8	3,390	504	0.18
			[486]	[51]	[0.05]
2006	62	9.7	3,754	618	0.30
			[738]	[33]	[0.06]
2007	73	11.5	4,265	499	0.28
			[819]	[81]	[0.05]
2008	61	9.6	10,196	506	0.73
			[2,441]	[81]	[0.02]
2009	48	7.5	12,640	625	0.15
			[2,727]	[58]	[0.03]
2010	72	11.3	7,134	348	0.37
			[1,684]	[75]	[0.04]
2011	58	9.1	6,078	182	0.21
			[1,797]	[85]	[0.02]
2012	51	8.0	9,918	402	0.33
			[3,477]	[125]	[0.04]
2013	41	6.4	6,072	133	0.05
			[2,533]	[31]	[0.03]
Total	636	100.0	6,070	394	0.31
			[1,477]	[86]	[0.04]

Panel B: Non-cross-listed firms

Year	No. of acquisitions	Percentage of sample	Mean acquirer market value of equity (C$mm) [Median]	Mean deal value [Median]	Mean relative deal size [Median]
2003	71	4.4	663	64	0.38
			[225]	[11]	[0.09]
2004	104	6.5	602	123	0.88
			[173]	[27]	[0.15]
2005	147	9.2	537	60	0.55
			[248]	[20]	[0.09]
2006	137	8.6	746	108	1.04
			[274]	[22]	[0.11]
2007	183	11.4	1,017	105	0.34
			[215]	[20]	[0.10]
2008	164	10.2	845	57	0.44
			[234]	[23]	[0.07]
2009	155	9.7	1,180	81	0.37
			[342]	[34]	[0.10]
2010	161	10.0	645	76	0.98
			[209]	[25]	[0.18]
2011	180	11.2	971	130	1.27
			[364]	[47]	[0.13]
2012	134	8.4	1,137	214	0.31
			[500]	[44]	[0.12]
2013	166	10.4	760	184	0.35
			[420]	[28]	[0.09]
Total	1602	100.0	846	110	0.63
			[326]	[31]	[0.11]

5. Methods and variables

The reason why I study the effects of D&O insurance variables on shareholder wealth in an event study with acquisition announcements as event dates, is the fact that they are among the largest and most readily observable forms of corporate investment. Berle and Means (1932) and Jensen and Meckling (1976) state that acquisitions tend to intensify the inherent conflicts of interest between directors and shareholders in larger public firms. Sometimes directors extract private benefits at the expense of shareholders by making value destroying acquisitions, and thus acquisitions suit very well for D&O insurance research.

5.1 Structure of the analysis

Before conducting analyses on D&O insurance coverage and D&O insurance premium, I first make comparisons between acquisitions made by cross-listed firms and non-cross-listed firms. To find out whether there are some fundamental differences in the deals that these two groups of firms make, I take a look at M&A activity, mean payment methods, mean target types, and relative deal sizes between the two groups.

After the comparison between cross-listed and non-cross-listed firms, I focus first on the D&O insurance coverage and then on the D&O insurance premium. I use univariate analyses, multivariate regressions, and robustness checks for both of the variables. In both cases, I first take an initial look at univariate statistics to see if there are any broad patterns in the data that are consistent with my hypotheses about the relation between D&O insurance variables and acquirer returns. With the D&O insurance premium, I also compare univariate statistics to two corporate governance indexes. Specifically, I split the sample into different groups to compare the mean values of acquirer cumulative abnormal announcement returns (CARs), acquisition premiums, and a variety of deal characteristics. The results for D&O insurance coverage will be discussed in Section 6.2.1, and the results for D&O insurance premium will be discussed in Section 6.3.1.

After the univariate analyses, I develop OLS regression models to examine the effect of D&O insurance variables on CARs. With the D&O insurance coverage, I first compare the effect of D&O insurance coverage on acquirer returns between cross-listed and non-cross-listed firms by using a dummy variable approach. Then I conduct further analyses for the cross-listed firms: I run three stages of OLS regressions to see whether the relation between the coverage and the acquirer returns hold. Each stage adds new control variables to the model: The first one controls for deal characteristics, second one adds interactions of three target status indicators and two method-of-payment indicators,

and the third one adds acquirer characteristics. I conduct the same three stages of OLS regressions for the D&O insurance premium as well. The results for the D&O insurance coverage will be discussed in Sections 6.2.2 and 6.2.3. The results for the D&O insurance premium will be discussed in Sections 6.3.2 and 6.3.3.

In the OLS regressions I use standard errors that are adjusted for heteroskedasticity introduced by White (1980), and acquirer clustering to calculate t-statistics for statistical significance based on two-sided tests at the 1%, 5%, and 10% level, respectively. Heteroskedasticity is adjusted in most empirical studies to avoid the assumption that the errors have the same variance across all observation points. In real life events it is most likely that the variances differ and thus heteroscedasticity-consistent standard errors allow the fitting of a model that does contain heteroscedastic residuals. Petersen (2009) points out that clustering standard errors at the acquirer level allows more flexibility in variance-covariance matrix as it relaxes the homoscedasticity assumption of the OLS regression by accounting for the fact that there might be a bunch of covariance structures that vary by a certain characteristic, but are homoscedastic within each cluster.

Finally, I conduct endogeneity and sensitivity tests for my results. I use instrumental variable approach for the D&O insurance coverage by using industry average D&O insurance incidence and median coverage ratio as instruments for the D&O insurance variables. I use a sensitivity test for the D&O insurance premium and governance indexes by classifying acquirers as dictatorship versus democracy firms based on the median values of these variables. I include these new dummy variables into the regression model and test whether my results are affected.

5.2 Variable construction

In the following subsections, I discuss the measurement of three categories of variables: acquirer return as my dependent variable, D&O insurance measures and corporate governance indexes as my key explanatory variables, and acquirer and deal characteristics as my control variables.

5.2.1 Acquirer return

Event study methodology is a standard in finance literature in evaluating the stock price reaction to a specific event. I measure acquirer announcement effects by market model adjusted stock returns around initial acquisition announcements. The market model assumes a linear relationship between the return of a stock and the return of the market portfolio. I obtain the announcement date from SDC's US Mergers and Acquisitions database and compute 5-day cumulative abnormal

announcement returns (*CARs*).[1] Next, I introduce the construction of a CAR starting from abnormal return (AR) that is calculated as follows:

$$Abnormal\ Return\ =\ Actual\ Return - Expected\ Return \tag{2}$$

where actual return is realized return of an acquirer around the announcement date and expected return is required return of an acquirer around the announcement date from the Capital Asset Pricing Model (CAPM) (see Sharpe, 1964). For each acquirer, the market model assumes that the returns generated are calculated as follows:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{3}$$

where R_{it} is the return on stock *i* at time *t*. The subscript *t* indicates the time, the subscript *i* indicates a stock of an acquirer, and the subscript *m* indicates the market. R_{mt} is the equal-weighted return of S&P/TSX Composite Index market portfolio during period *t*. Under the assumption of linearity and normality of returns, ε_{it} is a random error term for stock *i* at time *t*, β_i is an acquirer-specific coefficient, to be estimated from the market model regressions. The market model expressed in Eq. (3) is used to compute the return on the stock that would have been expected during the 5-day event window around the acquisition announcement. Eq. (3) is estimated by using a 200-day estimation period from *t* = -11 to *t* = -210, where *t* = 0 is the acquisition announcement date.

The abnormal return (AR) due to the announcement equals the actual return minus the expected return:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt}) \tag{4}$$

where daily ARs are computed for each day *t* to each acquirer *i*. The 5-day event window is the period between two days prior the acquisition announcement and two days after the acquisition announcement. The expected returns on the stock calculated from the Eq. (3) for the stock during the event window (-2, +2) are compared with the actual returns observed on each day within the event

[1] For a random sample of 500 acquisitions from 1990 to 2000, Fuller, Netter, and Stegemoller (2002) find that the announcement dated provided by SDC are correct for 92.6% of the sample and rest of the cases are off by no more than two trading days. Therefore, using a 5-day window over event days (-2, 2) captures close to all of the announcement effect, without introducing substantial noise to my analysis.

window. The difference between the expected return and the actual return during the event window is the CAR. It is calculated as follows:

$$CAR_i = \sum_{t=1}^{T} AR_{it} \tag{5}$$

where $\sum_{t=1}^{T} AR_{it}$ is the sum of ARs during the event window. More specifically, the CAR during the event window is calculated as follows:

$$CAR_{i-EW} = \sum_{t=T_1}^{T_2} AR_{it} \tag{6}$$

where EW is the event window, *T1* is the beginning date of the event window, and *T2* is the ending date of the event window.

5.2.2 Acquisition premiums

In the univariate analyses, I examine the effect of D&O insurance coverage on acquisition premiums to explore the potential channels through which D&O insurance variables affects acquirer returns. Following recent literature (see Datta, Iskandara-Datta, and Raman, 2001; Lin et al., 2011), I define acquisition premiums (*Acquisition premium_4w*) as the ratio of the offer price to the target's stock price four weeks prior to the initial announcement date minus one.

5.2.3 D&O insurance coverage

Following the literature (see Core, 1997; Chalmers et al., et al., 2002; Lin et al., 2011), I use two proxies for D&O insurance: (1) an indicator variable (*Insurance 1/0*) for whether the firm has purchased a D&O insurance policy; (2) a continuous variable (*Insurance coverage ratio*) defined as the personal coverage limit of the D&O insurance policy scaled by the firm's average market value of equity in a year. According to Baker and Griffith (2007), the market value of equity is in theory a proxy for the maximum liability exposure and both D&O insurance coverage and damage award are often positively correlated with the market value of equity.[2] If a firm does not purchase D&O insurance, the continuous variable is set to zero. If a firm publishes the information that they have

[2] Some firms publish their D&O insurance information in US dollars, which I convert into Canadian dollars using the average yearly conversion rate between the two currencies.

purchased D&O insurance, but does not give information on the amount of coverage, the firm can only be used as an indicator variable, not as a continuous variable.

5.2.4 D&O insurance premium

Kang and Klausner (2011) suggest that D&O insurance premium can be converted into a proxy for governance quality with a few adjustments for market capitalization, coverage limits, and industry. To account for market capitalization, I use a ratio dividing a firm's annual D&O insurance premium by its market capitalization on the acquisition date. For the ratio to yield useful comparisons, it has to control for insurance limits. Follow Baker and Griffith (2007) and Kang and Klausner (2011), I adjust the D&O premium ratio by recalculating the premium per dollar of coverage. Furthermore, Core (2000) suggests to use a natural logarithmic transformation of the premium as it reflects the average cost of coverage to the firm, and does not affect the firm's choice of the limit. The proxy for the quality of corporate governance derived from the D&O insurance premium (*Log(per dollar premium*) then looks as follows:

$$Log(per\ dollar\ premium) = \frac{total\ annual\ premium}{(effective\ coverage\ limit)(market\ capitalization)} \quad (7)$$

This variable adjusts for coverage limits and market capitalizations. I account for industry differences by comparing the per dollar premium within 12 Fama-French industries.

5.2.5 Globe and Mail Governance Index

Globe and Mail Governance Index (*GMI*) is a commercial multifactor governance index developed by the Canadian newspaper, the Globe and Mail. The newspaper has rated and published boards of Canadian firms using a set of governance criteria since 2003. The index has been used by several previous studies (see e.g. Foerster and Huen, 2004; Ben-Amar and Boujenoui, 2008; Gouiaa and Zéghal, 2013).

In 2013 the ratings were based on 36 individual questions that comprised four subcategories. The Globe and Mail gathers answers to these questions from information published in the annual shareholder proxy circulars of different firms which are listed in the S&P/TSX Composite Index. The first dimension is board composition that includes 10 questions worth 31 marks out of 100. Board composition evaluates the independence of the directors serving on the board, the audit committee, the compensation committee and the remuneration committee. The second dimension is shareholding and compensation that includes 10 questions worth 28 marks out of 100. Shareholding and compensation evaluates compensation policy and detects the ownership of directors and the CEO.

The third dimension is shareholder rights that includes 8 questions worth 28 marks out of 100. Finally, the fourth dimension is disclosure that includes 8 questions worth 13 marks out of 100. Disclosure measures the level and the quality of information on corporate governance. Theoretically, the higher value of the index implies a strong governance system and an effective board complying with the rules and requirements of good governance.

5.2.6 Board Shareholder Confidence Index

Board Shareholder Confidence Index (*BSCI*) is an academic index, which has been developed and published since 2003 by The Clarkson Centre for Business Ethics and Board Effectiveness of the Joseph L. Rotman School of Management at the University of Toronto. It is an annual examination of the quality of governance practices related to boards of directors of publicly traded Canadian firms listed in the S&P/TSX Composite Index. The BSC Index is comprised of the factors often used by active shareholders to assess the quality of boards of directors. It seeks to capture factors affecting shareholders' confidence in the boards' abilities to fulfill their duties.

In 2013 the ratings were developed using criteria separated into three groups that include altogether 30 steps. The first one is individual potential that includes three subgroups and three additional subgroups that focus on the directors themselves. The second one is group potential that includes six subgroups that examine the board as a whole. Finally, the third one is board decision output that includes eight subgroups and 17 additional subgroups that analyze board outputs. Each firm begins with 100 points from which deductions are made.[3] The index has been used by several previous studies (see Beekes, Brown and Chin, 2007; Switzer and Cao, 2011; Gouiaa and Zéghal, 2013).

[3] BSCI index grading system has been changed during the time period of this study: Between 2003 and 2010 they published their grades in letters. In 2011 and 2012 letter grades and numerical grades were published concurrently with the highest numeral grade of 100. In 2013 only numerical grades were published with the highest grade of 150. Following Beekes et al. (2007), Switzer and Cao (2011), and Gouiaa and Zéghal (2013) I transformed the overall score ranging from C to AAA+ in a metric variable theoretically ranging between 20 and 100 to facilitate the analysis of the index and make scores for different years alike. Total letter grades are determined as follows: AAA+ = 100, AAA = 95, AA = 90, A = 75, B = 50, and C = <50. A higher value reflects a better quality of the board. 2013 grades are converted to reflect 100 point system.

5.2.7 Deal characteristics

Following the prior literature, I use controls for deal characteristics in my regressions, including target ownership status, method of payment, industry relatedness of the acquisition, and whether the acquirer and the target are both from high tech industries.[4]

Fuller, Netter, and Stegemoller (2002) find that acquirers making multiple acquisitions experience significantly negative abnormal returns when buying public firms and significantly positive abnormal returns when targets are private firms or subsidiaries. They interpret that acquirers capture a liquidity discount when buying private or subsidiary targets. Moeller, Schlingemann, and Stulz (2004) and Masulis, Wang, and Xie (2007) show similar results, but they both also find that subsidiary targets generate the highest CARs. I take target status into account by creating three indicator variables denoted by public target (*Public target 1/0*), private target (*Private target 1/0*), and subsidiary target (*Subsidiary target 1/0*) to represent different types of targets.

In the existing finance literature it is widely accepted that the method of payment is related to the stock market effect of acquisition announcements. Acquirers experience significantly negative abnormal returns when the acquisition is financed by equity. Negative returns are generally explained by the adverse selection problem in equity issuance analyzed by Myers and Majluf (1984). I create two indicator variables based on how the deal is financed: stock deal (*Stock deal 1/0*) and all-cash deal (*All-cash deal 1/0*). Stock deal equals one for acquisitions in which any amount of stock has been used to finance the deal and zero otherwise. All-cash deal equals one if only cash has been used and zero otherwise. According to the studies made by Chang (1998) and Fuller et al. (2002), the stock price impact of stock-financed deals is less negative or even positive when the acquired firm is privately held. They suggest that bidding shareholders benefit from the active monitoring of the acquiring firm by newly created blockholders when closely held private target firms are purchased by stock. I also control for friendly deals (*Friendly 1/0*).

I follow Masulis et al. (2007) and create the following six mutually exclusive and exhaustive deal categories from three target status indicators and two method-of-payment indicators to fully capture their effects: public all-cash deal (*Public target 1/0 x all-cash deal 1/0*), public stock deal (*Public target 1/0 x stock deal 1/0*), private all-cash deal *(Private target 1/0 x all-cash deal 1/0*), private stock deal *(Private target 1/0 x stock deal 1/0*), subsidiary all-cash deal (*Subsidiary target 1/0 x all-cash*

[4] I omit relative deal size from the regressions as it reduces the sample size considerably.

deal 1/0), and subsidiary stock deal (*Subsidiary target 1/0 x stock deal 1/0*). I exclude the subsidiary stock deal indicator from the regression equations to avoid perfect multicollinearity with the regression intercept.

Masulis et al. (2007) show negative coefficients for all five categories, and they infer that acquisitions of subsidiary targets by stock financing, the omitted deal type, generate the highest acquirer returns. Their findings are in line with Moeller et al. (2004) who show that holding the method of payment constant, public target acquisitions are associated with the lowest abnormal returns, private target acquisitions in between, and subsidiary target acquisitions are associated with the highest abnormal returns. Their findings are also in line with Chang (1998) and Fuller et al. (2002) who show that holding target ownership status constant, stock financing increases acquirer returns in deals involving private or subsidiary targets, while the reverse is true in deals involving public targets. In addition, they assume that the difference in acquirer returns between public target acquisitions and private target acquisitions is primarily due to stock-financed transactions, because the two types of deals generate similar stock price reactions when they are financed by cash.

I use a binary variable (*High tech 1/0*) defined by Loughran and Ritter (2004), that equals one if a deal is between firms in high tech industries and zero otherwise. Masulis et al. (2007) find that acquirer returns are lower in deals combining two high-tech firms. They expect the negative relation to happen because of the importance of human capital and intellectual property at these firms, which are often lost due to the higher employee turnover caused by acquisitions. Thus, it is difficult for technology firms to integrate smoothly after the acquisition and acquirers in these high tech transactions are more likely to underestimate the costs and overestimate the synergies generated by the combination.

The predicted effect of diversifying acquisitions on acquirer returns is ambiguous. Villalonga (2004a, 2004b) and Campa and Kedia (2002) find that diversification does not necessarily lead to lower firm value and sometimes it is associated with higher firm value. However, according to Morck et al. (1990) diversifying acquisitions usually destroy shareholder value, while potentially benefiting self-interested directors. Amihud and Lev (1981) suggest that diversification can reduce firm risk and thus increase the expected utility of poorly diversified risk-averse directors. According to Morck et al. (1990), directors can also acquire unrelated assets that fit their own strengths which makes it more costly for shareholders to replace them. Accordingly, Masulis et al. (2007) show lower acquirer returns for diversifying acquisitions, but their results are insignificant. I classify an acquisition as diversifying if the target and the acquirer do not share a Fama-French industry code, and I create a

binary variable for diversifying acquisition (*Unrelated deal 1/0*) that equals one for diversifying acquisitions and zero otherwise.

Asquith, Bruner, and Mullins (1983) and Moeller et al. (2004) find that CARs increase in relative deal size, although Moeller et al. find the reverse for the subsample of large acquirers. However, including relative deal size reduces my sample size considerably, and I therefore omit it from the regression. It is included in the univariate analyses.

5.2.8 Acquirer characteristics

I control for cross-listing (*cross-listed 1/0*), firm size (*Log(assets)*), Tobin's *q* (*Tobin's q*), leverage (*Leverage*), and free cash flow (*FCF*), all of which are measured at the fiscal year-end prior to the acquisition announcement. I also control for pre-announcement stock price run-up (*Stock price run-up %*), which is measured over the 200-day window from event day –210 to event day –11. Moeller et al. (2004) and Masulis et al. (2007) find that acquirer size is negatively correlated CARs. They find that larger acquirers pay on average higher premiums and make acquisitions that generate negative dollar synergies. They interpret the negative relation as evidence supporting the directorial hubris hypothesis by Roll (1986). According to Masulis et al. (2007), an alternative explanation is that large firm size serves as takeover defense. This is due to the fact that it takes more resources to acquire a larger target and thus directors of larger firms are more entrenched and more likely to make value reducing acquisitions. In my empirical tests, I define firm size as the log transformation of the acquirer's total assets.

Prior studies find an ambiguous effect of an acquirer's Tobin's *q* on CARs. Lang, Stulz, and Walkling (1991) and Servaes (1991) show a positive relation for tender offer and public firm acquisitions. However, Moeller et al. (2004) find a negative relation in a comprehensive sample of acquisitions and Masulis et al. (2007) find Tobin's *q* having a negative effect on acquirer returns when stock price run-up is absent. I define Tobin's q as the ratio of acquirer's market value of assets minus the book value of common equity plus the market value of common equity.

I also control for the acquirer's financial leverage. According to Masulis et al. (2007), leverage works as an important governance mechanism in many ways: First, higher debt levels reduce future free cash flows and limit directorial discretion. Second, leverage provides incentives for directors to improve firm performance, because they have to cede significant control to creditors and often lose their jobs if their firms face financial distress. Third, leverage is related to a firm's takeover protection (see also: Garvey and Hanka, 1999). Masulis et al. (2007) find positive, but insignificant, effect of

leverage on acquirer returns. I define leverage as a firm's book value of long-term debt and short-term debt divided by its market value of total assets.

Jensen’s (1986) free cash flow hypothesis predicts a negative coefficient for current FCF on acquirer returns, because additional FCFs give directors more resources to engage them in empire building. However, higher FCFs can also proxy for better recent firm performance. Therefore, it can be correlated with higher quality directors, who tend to make better acquisition decisions. Masulis et al. (2007) do not find significant effect of FCF on acquirer returns. I define FCF as operating income before depreciation minus interest expense minus income taxes minus capital expenditures, scaled by book value of total assets.

6. Empirical results

In this section, I present the empirical results of my study. First, in Section 6.1 I compare M&A activity, industry composition, and the relation between payment methods, target types, and deal sizes with CARs between cross-listed firms and non-cross-listed firms. Second, in Section 6.2 I present the results of the D&O insurance coverage. Finally, in Section 6.3 I present the results of the D&O insurance premium.

6.1 Comparison between cross-listed and non-cross-listed acquirers

In this section, I compare M&A activity and the relation between payment methods, target types, and deal sizes with CARs between cross-listed firms and non-cross-listed firms.

6.1.1 M&A activity

First, I compare M&A activity between cross-listed firms and non-cross-listed firms. According to Boyer and Tennyson (2011), high liability exposure in the US can cause under-investment problem by inducing directors to be overly conservative and can cause them to forgo risky positive-NPV. If that was the case, firms with low D&O insurance coverage should do relatively less acquisitions if they were cross-listed comparing to non-cross-listed firms. As my sample includes D&O insurance data only for the firms that have made acquisitions during the sample period, I cannot get direct results of the M&A activity between the two groups. However, I can compare the weights of acquirers with different D&O insurance coverage levels in my sample.

Figure 1 presents the no. of acquisitions for firms with different levels of D&O insurance coverage for the cross-listed group. It shows that a large share of cross-listed acquirers in my sample have high D&O insurance coverage limits. More specifically, 42.3% of cross-listed acquirers has over C$55M coverage limit indicating that firms with low D&O insurance coverage can be suffering from the under-investment problem.

Figure 2 presents the no. of acquisitions for firms with different levels of D&O insurance coverage for the non-cross-listed group. It shows that the share of firms with low D&O insurance coverage levels is much larger than in cross-listed group. More specifically, only 9.3% of non-cross-listed acquirers has over C$55M coverage limit indicating that firms with low D&O insurance coverage are not suffering from the under-investment problem as much as the cross-listed firms with low D&O insurance coverage.

Figure 1: Annual D&O policy limit levels and no. of acquisitions: Cross-listed firms

Figure 1 presents 470 acquisitions made by cross-listed firms between 2003 and 2013, subject to the availability of D&O insurance information. The histogram is based on annual D&O insurance coverage levels and no. of acquisitions made by firms within each interval. Cumulative % presents the slope of change in the amount of acquisitions on the higher D&O insurance coverage level. C$mm is millions of Canadian dollars. Variable definitions are in Appendix A.

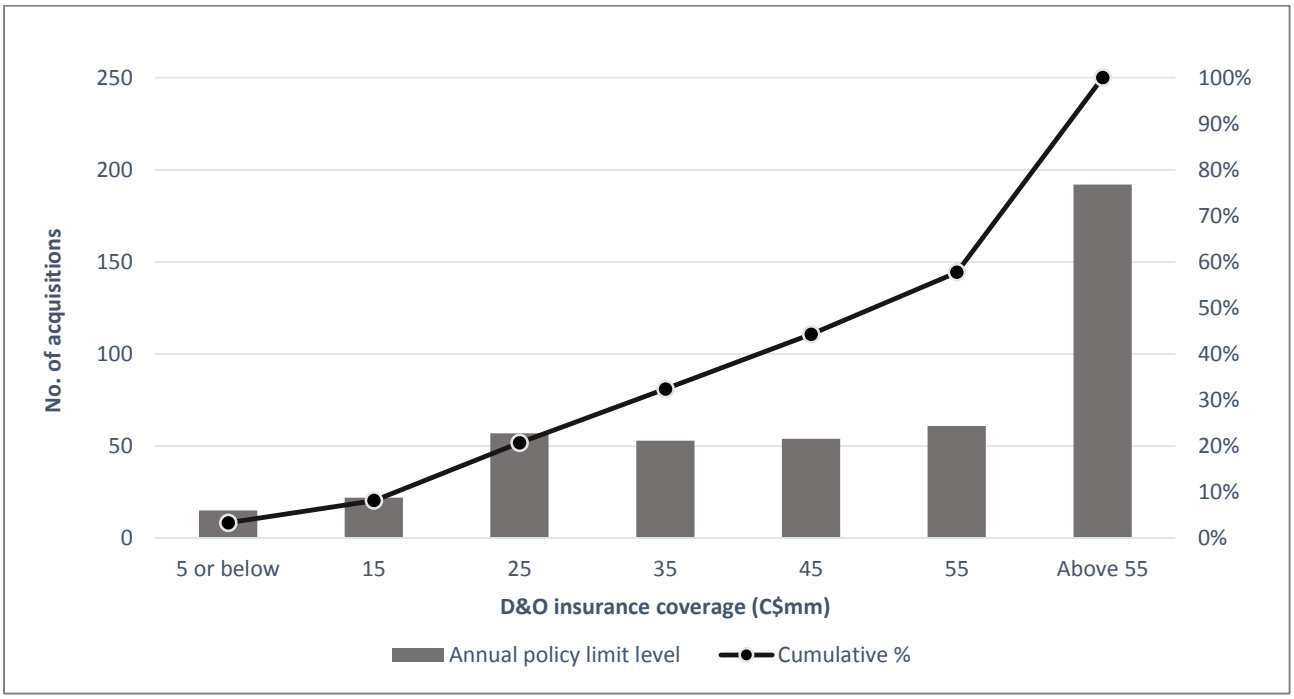
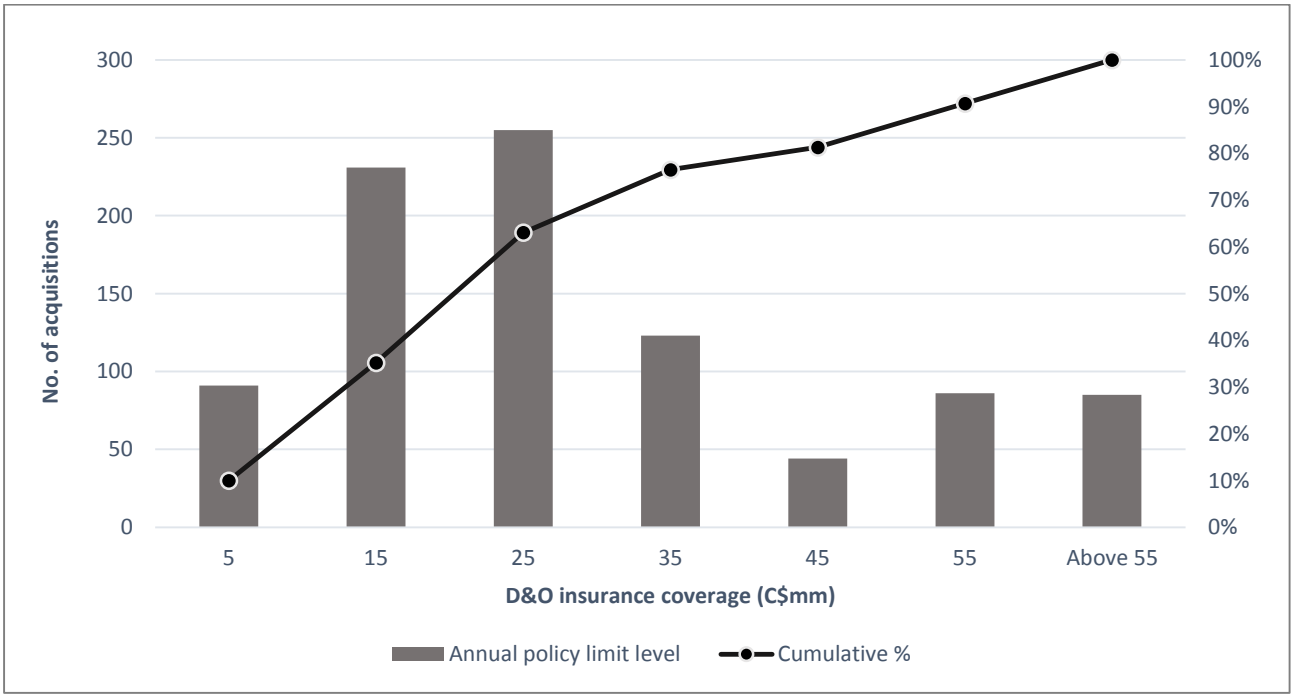


Figure 2: Annual D&O policy limit levels and no. of acquisitions: Non-cross-listed firms

Figure 2 presents 944 acquisitions made by non-cross-listed firms between 2003 and 2013, subject to the availability of D&O insurance information. The histogram is based on annual D&O insurance coverage levels and no. of acquisitions made by firms within each interval. Cumulative % presents the slope of change in the amount of acquisitions on the higher D&O insurance coverage level. C$mm is millions of Canadian dollars. Variable definitions are in Appendix A.



Differences in industry compositions between cross-listed and non-cross-listed firms could affect my results as investment activity can vary between different industries. However, industries of cross-listed and non-cross-listed acquirers in my sample are quite uniform. The industry compositions for both groups are presented in Appendix E.

6.1.2 Payment method, target type, and deal size

Because my sample separates non-cross-listed and cross-listed Canadian firms, it is different from the standard samples used in most of the M&A literature. Therefore, I first take a look whether there are some differences between the two groups relating to their payment methods, target types, and deal size and compare the mean values of acquirer abnormal announcement returns.

Table 2 presents CARs by deal types for cross-listed firms (Panel A) and non-cross-listed firms (Panel B). In the cross-listed group acquirers experience higher abnormal returns when they pay for their acquisitions at least partly by stock as comparison to using only cash, and both payment methods result in positive CARs. CARs of cross-listed firms that make stock deals are 0.88% higher than CARs of all-cash deals. However, the difference is not statistically significant and thus I cannot conclude that the payment method affects the acquisition outcome with this sample. On the other hand, non-cross-listed firms using only cash experience 0.49% higher CARs than the ones using stock financing as well, but the difference is not statistically significant.[5] In the non-cross-listed group both payment methods result in positive CARs like in the other group. The positive returns are the opposite of most of the M&A studies, which typically find that stock financed M&As result in negative CARs. However, according to a recent study made by Golubov, Petmezas, and Travlos (2011), a stock-financed acquisition announcement should be thought of as having two distinct components: a takeover component and an equity issue component. They suggest that after the implied equity financing component is taken away from the announcement return of stock acquirers, the method of payment generally has no further explanatory power in the cross-section of acquirer returns.

As it is in the Canadian sample used by Lin et al. (2011) and US based samples, the acquisitions for both cross-listed and non-cross-listed firms are significantly value-increasing for acquirer shareholders when comparing subsidiary targets to public targets. Also with my cross-listed group, acquisitions targeting private firms results in significantly higher returns than acquisitions targeting

[5] There is no statistically significant difference in CARs between the payment methods when combining the non-cross-listed and cross-listed groups.

public firms. In both groups large deals tend to be more value-increasing than small deals, but the results are not significant.

Table 2: Acquirer returns and deal types between cross-listed and non-cross-listed firms

This table compares acquirer cumulative abnormal announcement returns (CAR (-2, +2) (%)) between subgroups based on deal characteristics for the sample of 2,238 acquisitions made by firms listed in the Toronto Stock Exchange between 2003 and 2013, subject to the availability of variables. Panel A consists of 636 acquisitions made by firms cross-listed in one of the US stock exchanges (NYSE, Amex, or Nasdaq) and Panel B consists of 1,602 acquisitions made by non-cross-listed firms. *p*-values are from two-tailed *t*-tests. The test of difference under target type is private vs. public and subsidiary vs. public, respectively. A deal is classified as a small (large) deal if the relative size is below (above) the sample median. *,**,***: statistically significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively. Variable definitions are in Appendix A.

Panel A: Cross-listed firms

	N	Mean (%)	Difference (%)	*p*-value
Payment method				
All-cash deals	137	0.178	-0.879	0.38
Stock deals	114	1.057		
Target type				
Deals targeting a public firm	122	-0.948		
Deals targeting a private firm	280	1.074	-2.022***	0.00
Deals targeting a subsidiary	220	0.755	-1.703**	0.02
Relative size				
Small deals	194	0.125	-0.559	0.26
Large deals	194	0.910		

Panel B: Non-cross-listed firms

	N	Mean (%)	Difference (%)	*p*-value
Payment method				
All-cash deals	269	0.900	0.488	0.49
Stock deals	353	0.412		
Target type				
Deals targeting a public firm	198	-0.270		
Deals targeting a private firm	856	0.521	-0.791	0.28
Deals targeting a subsidiary	516	1.414	-1.684**	0.03
Relative size				
Small deals	536	0.315	-0.501	0.29
Large deals	536	0.816		

6.2 D&O insurance coverage and acquirer returns

Lin et al. (2011) find a negative relation between D&O insurance variables and acquirer returns in their sample consisting firms listed in the TSX. In this section, I will be studying whether there is a difference in the relation between D&O insurance and acquirer returns of firms that are listed only in TSX and firms that are cross-listed in the US. I will be looking for any difference in the relation

between D&O insurance coverage and acquirer returns between these two groups and whether one or both groups are in line with the findings of Lin et al. (2011). After the comparison between the two groups, I will focus on the cross-listed firms, as the relation between their acquirer returns and D&O insurance variables have not yet been studied. Table 3 shows the summary statistics of the D&O insurance variables for cross-listed firms and Table 4 shows the summary statistics for non-cross-listed firms. The summary statistics for the whole sample is in Appendix C.

Table 3: Summary statistics of D&O insurance coverage: Cross-listed firms

This table presents summary statistics for the variables used in the analysis for the time period between 2003 and 2013. The sample consists of 636 completed acquisitions made by firms that were listed in the Toronto Stock Exchange and cross-listed in one of the US stock exchanges (NYSE, Amex, or Nasdaq). All the acquisitions in the sample are subject to the availability of D&O insurance and stock price information. C$mm is millions of Canadian dollars. Variable definitions are in Appendix A.

			Percentiles			
Variable	Mean	Std. dev	25th	50th	75th	*N*
D&O insurance variable						
Insurance (1/0)	0.835	0.372	1.000	1.000	1.000	636
Insurance coverage (C$mm)	84.770	78.260	30.000	50.000	100.000	470
Insurance coverage ratio	0.090	0.181	0.014	0.035	0.079	454
Acquirer return						
CAR (-2, +2) (%)	0.565	6.379	-2.442	0.242	3.137	636
Acquisition premiums						
Acquisition premium_4w (%)	44.311	77.276	15.130	32.795	62.550	82
Deal characteristics						
All-cash deal (1/0)	0.215	0.411	0.000	0.000	0.000	636
Stock deal (1/0)	0.179	0.384	0.000	0.000	0.000	636
Friendly deal (1/0)	0.967	0.179	1.000	1.000	1.000	636
Relative size	0.314	1.383	0.012	0.043	0.178	389
Unrelated deal (1/0)	0.307	0.461	0.000	0.000	1.000	636
Private target (1/0)	0.440	0.497	0.000	0.000	1.000	636
Public target (1/0)	0.192	0.394	0.000	0.000	0.000	636
Subsidiary target (1/0)	0.346	0.476	0.000	0.000	1.000	636
High tech (1/0)	0.211	0.408	0.000	0.000	0.000	636
Acquirer characteristics						
Log(assets)	14.415	2.193	12.983	14.329	16.144	611
Market-to-book	2.134	2.643	0.800	1.680	2.555	604
Leverage	25.261	21.452	2.730	25.000	38.800	630
Tobin's *q*	1.905	1.470	1.181	1.518	2.011	626
Stock price run-up (%)	0.058	0.436	-0.166	0.013	0.196	636
FCF	-0.032	0.306	-0.074	0.032	0.086	589

As can be seen from Table 3, the average CAR for the cross-listed group is about 0.57%. About 84% of cross-listed firms purchase D&O insurance policies, and in absolute terms their average policy limit is C$84.8M.

Table 4: Summary statistics of D&O insurance coverage: Non-cross-listed firms

This table presents summary statistics for the variables used in the analysis for the time period between 2003 and 2013. The sample consists of 1,602 completed acquisitions made by non-cross-listed firms that were listed only in the Toronto Stock Exchange. All the acquisitions in the sample are subject to the availability of D&O insurance and stock price information. C$mm is millions of Canadian dollars. Variable definitions are in Appendix A.

			Percentiles			
Variable	Mean	Std. dev	25th	50th	75th	*N*
D&O insurance variable						
Insurance (1/0)	0.670	0.470	0.000	1.000	1.000	1602
Insurance coverage (C$mm)	18.079	24.114	15.000	20.000	35.000	944
Insurance coverage ratio	0.187	1.169	0.022	0.051	0.134	914
Acquirer return						
CAR (-2, +2) (%)	0.735	7.661	-2.430	0.249	3.392	1602
Acquisition premiums						
Acquisition premium_4w (%)	35.847	49.228	14.820	29.980	48.620	167
Deal characteristics						
All-cash deal (1/0)	0.168	0.374	0.000	0.000	0.000	1602
Stock deal (1/0)	0.220	0.415	0.000	0.000	0.000	1602
Friendly deal (1/0)	0.989	0.102	1.000	1.000	1.000	1602
Relative size	0.629	2.312	0.037	0.109	0.365	1072
Unrelated deal (1/0)	0.409	0.492	0.000	0.000	1.000	1602
Private target (1/0)	0.534	0.499	0.000	1.000	1.000	1602
Public target (1/0)	0.124	0.329	0.000	0.000	0.000	1602
Subsidiary target (1/0)	0.322	0.467	0.000	0.000	1.000	1602
High tech (1/0)	0.092	0.289	0.000	0.000	0.000	1602
Acquirer characteristics						
Log(assets)	12.945	1.806	11.965	13.003	14.218	1575
Market-to-book	1.604	4.904	0.870	1.420	2.070	1465
Leverage	30.770	26.415	5.758	28.585	51.438	1586
Tobin's *q*	1.762	1.959	1.110	1.338	1.869	1544
Stock price run-up (%)	0.042	0.432	-0.173	0.006	0.186	1602
FCF	-0.030	0.202	-0.074	0.016	0.069	1454

Table 4 shows that the average CAR for non-cross-listed group is about 0.74%, which is higher than the average CAR of the cross-listed group. About 67% of non-cross-listed firms purchase D&O insurance policies, and in absolute terms their average policy limit is C$18.1M. This means that the share of firms purchasing the D&O insurance and the average coverage limit are lower in the non-

cross-listed group than in the cross-listed group. On the other hand, the insurance coverage ratio is higher for non-cross-listed firms than for cross-listed firms, which show that non-cross-listed firms carry relatively higher D&O insurance policies. The share of firms carrying a D&O insurance policy for the whole sample is about 72%, which is in line with the sample Lin et al. are using in their study.

6.2.1 Univariate analyses

Before conducting regression analysis in the next section, I first take an initial look at univariate statistics to see if there are any broad patterns in the data between cross-listed and non-cross-listed firms. Then, I split the two sample groups into subgroups based on their median coverage ratio to see if there are any broad patterns in the data between firms with different levels of D&O insurance protection. I compare the mean values of acquirer CARs, acquirer premiums, and variety of deal and acquirer characteristics. The results are presented in Tables 5 and 6.

Table 5: Univariate analysis of cross-listing

This table presents univariate statistics for 1,368 completed acquisitions made by firms listed in the Toronto Stock Exchange (TSX) between 2003 and 2013, subject to the availability of D&O insurance and stock price information, and the existence of the insurance. The table reports averages of acquirer abnormal announcement returns, acquisitions premiums, and deal and acquirer characteristics for subsamples based on cross-listing status. Firms that are listed only in TSX are the non-cross-listed group and firms that are cross-listed in one of the US stock exchanges (NYSE, Amex, or Nasdaq) are the cross-listed group. *p*-values are from two-tailed t-tests. *,**,***: statistically significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively. Variable definitions are in Appendix A.

	Cross-listed firms		Non-cross-listed firms			
Variable	Mean	*N*	Mean	*N*	Difference	*p*-value
Acquirer return						
CAR (-2, +2) (%)	0.608	454	0.389	914	0.217	0.56
Acquisition premiums						
Acquisition premium_4w (%)	43.112	33	36.707	77	6.405	0.52
Deal characteristics						
All-cash deal (1/0)	0.231	454	0.179	914	0.052**	0.03
Stock deal (1/0)	0.149	454	0.157	914	-0.008	0.70
Relative size	0.319	276	0.157	914	0.162	0.70
Unrelated deal (1/0)	0.334	454	0.480	914	-0.146***	0.00
Private target (1/0)	0.453	454	0.567	914	-0.114***	0.00
Public target (1/0)	0.182	454	0.094	914	0.088***	0.00
Subsidiary target (1/0)	0.343	454	0.320	914	0.023	0.40
Both high tech (1/0)	0.226	454	0.120	914	0.106***	0.00
Acquirer characteristics						
Leverage	25.624	454	34.609	908	-8.985***	0.00
Log(assets)	14.679	444	13.347	904	1.333***	0.00
Tobin's *q*	1.795	451	1.680	902	0.115	0.15
FCF	-0.038	427	-0.052	813	0.014	0.44
Market-to-book	2.127	434	1.461	877	0.666***	0.00
Stock price run-up (%)	0.045	454	0.009	914	0.036***	0.00

In Table 5, I compare the mean values of acquirer CARs, acquisition premiums, and deal and acquirer characteristics between cross-listed and non-cross-listed firms. Compared to summary statistics in Tables 3 and 4, the average CAR of cross-listed firms has increased, and the average CAR of non-cross-listed firms has reduced. Furthermore, the average acquisition premium of cross-listed firms has reduced and the average acquisition premium of non-cross-listed firms has increased. The main difference between these tables is that the summary statistics include all firms in the sample, but Table 5 only firms that have purchased D&O insurance. The changes in CARs and acquisition premiums of the two groups can indicate that cross-listed firms can benefit from the D&O insurance purchase. However, the differences between CARs or acquisition premiums between cross-listed and non-cross-listed firms are not statistically significant. Thus, more research has to be done to find out whether the effect of D&O insurance varies between the two groups.

Other findings in Table 5 are the following: Cross-listed firms (i) make significantly more all-cash deals, and (ii) make significantly less unrelated deals, which are associated with positive acquirer returns in the prior literature (see e.g. Masulis et al., 2007). On the other hand, (iii) cross-listed firms target significantly more public targets and less private targets, (iv) are significantly less leveraged, (v) are significantly larger, and (vi) have significantly higher stock price run-ups before acquisitions, which are associated with negative acquirer returns in the prior literature (see e.g. Masulis et al., 2007). These results suggest that cross-listing do affect both the deal and acquire characteristics, but cross-listing cannot explain acquirer returns alone.

Lin et al. (2011) show that the decision to purchase D&O insurance can affect acquirer returns as well. I find the same negative relation, albeit insignificant, between the purchase of D&O insurance and acquirer returns with the non-cross-listed group. With the cross-listed firms there appears to be no relation as the *p*-value of the difference is high (0.67). The inexistent relation can be due to the fact that the share of cross-listed firms purchasing the insurance is really high, and thus the sample size for firms not having the insurance is small. I include the results of univariate analysis based on the insurance indicator in Appendix D, as they can help to interpret results relating to non-cross-listed firms later in this study.

As the insurance indicator does not provide significant results for the cross-listed group, I also compare how the level of D&O insurance coverage ratio affects acquirer returns between cross-listed and non-cross-listed firms. I split both groups based on the median coverage ratio into subgroups of low coverage ratio and high coverage ratio. Then I compare CARs, acquisitions premiums, and deal and acquirer characteristics between these subgroups in Table 6.

Table 6: Univariate analysis of D&O insurance coverage: High and low ratios

This table presents univariate statistics for 1,368 completed acquisitions made by firms listed in the Toronto Stock Exchange (TSX) between 2003 and 2013, subject to the availability of D&O insurance and stock price information, and the existence of the insurance. The table reports averages of acquirer abnormal announcement returns, acquisitions premiums, and deal and acquirer characteristics for subsamples based on below and above median coverage ratios (high coverage and low coverage). Panel A consist of 454 acquisitions made by firms cross-listed in one of the US stock exchanges (NYSE, Amex, or Nasdaq). Panel B consists of 914 acquisitions made by non-cross-listed firms. *p*-values are from two-tailed *t*-tests. *,**,***: statistically significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively. Variable definitions are in Appendix A.

Panel A: Cross-listed firms

	Low coverage		High coverage			
Variable	Mean	*N*	Mean	*N*	Difference	*p*-value
Acquirer return						
CAR (-2, +2) (%)	-0.411	227	1.459	227	-1.870***	0.00
Acquisition premiums						
Acquisition premium_4w (%)	47.579	14	39.821	19	7.758	0.59
Deal characteristics						
All-cash deal (1/0)	0.271	227	0.198	227	0.073*	0.07
Stock deal (1/0)	0.126	227	0.169	227	-0.044	0.19
Relative size	0.080	142	0.573	134	-0.493	0.19
Unrelated deal (1/0)	0.401	227	0.278	227	0.123**	0.01
Private target (1/0)	0.377	227	0.516	227	-0.139***	0.00
Public target (1/0)	0.203	227	0.165	227	0.038	0.31
Subsidiary target (1/0)	0.382	227	0.310	227	0.071	0.11
Both high tech (1/0)	0.203	227	0.246	227	-0.043	0.27
Acquirer characteristics						
Leverage	27.541	227	23.706	227	3.835*	0.06
Log(assets)	15.910	227	13.391	217	2.519***	0.00
Tobin's *q*	1.992	227	1.596	224	0.397***	0.00
FCF	-0.011	213	-0.066	214	0.055*	0.09
Market-to-book	2.414	221	1.831	213	0.583**	0.02
Stock price run-up (%)	0.071	227	0.019	227	0.053**	0.02

Panel B: Non-cross-listed firms

	Low coverage		High coverage			
Variable	Mean	*N*	Mean	*N*	Difference	*p*-value
Acquirer return						
CAR (-2, +2) (%)	0.063	457	0.715	457	-0.652	0.16
Acquisition premiums						
Acquisition premium_4w (%)	36.117	43	37.454	34	-1.337	0.93
Deal characteristics						
All-cash deal (1/0)	0.214	457	0.144	457	0.070***	0.01
Stock deal (1/0)	0.142	457	0.172	457	-0.030	0.21
Relative size	0.150	316	0.570	282	-0.421	0.21
Unrelated deal (1/0)	0.525	457	0.434	457	0.091***	0.01
Private target (1/0)	0.519	457	0.616	457	-0.097***	0.00
Public target (1/0)	0.127	457	0.061	457	0.066***	0.00
Subsidiary target (1/0)	0.330	457	0.310	457	0.020	0.51
Both high tech (1/0)	0.081	457	0.159	457	-0.078***	0.00
Acquirer characteristics						
Leverage	39.240	456	29.936	452	9.304***	0.00
Log(assets)	14.290	456	12.386	448	1.904***	0.00
Tobin's *q*	1.641	455	1.720	447	-0.079	0.46
FCF	-0.018	407	-0.086	406	0.068***	0.00
Market-to-book	2.014	448	0.885	429	1.129***	0.00
Stock price run-up (%)	0.039	457	-0.021	457	0.060***	0.00

Panel A of Table 6 shows that (i) cross-listed firms in the high coverage subgroup experience on average significantly higher acquirer CARs and pay insignificantly lower acquisition premiums. Their mean CARs are on average 1.9% higher than in the other subgroup. Cross-listed firms with high coverage (ii) make significantly less unrelated deals, (iii) target significantly more private firms, (iv) are significantly smaller, (v) their Tobin's *q* ratios are significantly lower, and (vi) their stock price run-ups before acquisition announcements are significantly lower than in the low coverage subgroup of cross-listed firms, which all are associated with positive CARs in the prior literature (see e.g. Masulis et al., 2007). On the other hand, cross-listed firms with high coverage (vi) make significantly less all-cash deals and (vii) are significantly less in leverage than firms in the low coverage subgroup, which both are associated with negative CARs in the prior literature (see e.g. Masulis et al., 2007). Furthermore, (viii) market-to-book ratios of cross-listed firms with high coverage are significantly lower than in the low coverage group indicating that their valuations are lower. High market-to-book ratio is associated with negative CARs in the prior literature, if it leads to more stock financing of deals. However, that is not the case with the low coverage subgroup of cross-listed firms.

Panel B of Table 6 presents the results for non-cross-listed firms with above and below median D&O insurance coverage ratios. There is no significant difference in the average CARs or acquisition premiums between the two subgroups. Non-cross-listed firms with high coverage (i) make significantly less unrelated deals, (ii) target significantly more private targets, (iii) target significantly less public targets, (iv) are significantly smaller, and (v) their stock price run-ups before acquisition announcements are significantly lower than firms in the non-cross-listed low coverage group, which all are associated with positive CARs in the prior literature (see e.g. Masulis et al., 2007). On the other hand, non-cross-listed firms with high coverage (vi) make significantly less all-cash deals, (vii) are significantly less in leverage, (viii) make significantly more acquisitions between two high tech firms, and (ix) their Tobin's q ratios are significantly higher than firms in the non-cross-listed low coverage group, which all are associated with negative CARs in prior literature (see e.g. Masulis et al., 2007).

6.2.2 Multivariate analysis: Cross-listing

In this section, I compare the impact of D&O insurance coverage on CARs between cross-listed firms and non-cross-listed firms using multivariate regression. First, I show that my results are in line with

Lin et al. (2011) with the non-cross-listed firms and that the results differ for the cross-listed ones. The empirical model is as follows:

$$CAR = f(D\&O\ insurance\ measure, Cross - listed * D\&O\ insurance\ measure, \\ Deal\ characteristics, Industry\ and\ time\ effects) \quad (8)$$

In Eq. (8), the dependent variable is the acquirer's five-day CAR (-2, +2) around each announcement. The independent variables are the D&O insurance measures: the insurance indicator and insurance coverage ratio. I develop a dummy variable based on firm's cross-listing status and interact it with the insurance measure to test whether cross-listing affects the relation between acquirer returns and D&O insurance variables. The results from ordinary least squares (OLS) regressions of Eq. (8) are presented in Table 7, controlling for industry and year dummies, and deal characteristics described in Section 5.2. Industry fixed-effects are based on 12 Fama-French industry groups.[6] The *t*-statistics are adjusted for heteroskedasticity and acquirer clustering.

In column 1 of Table 7, the D&O insurance indicator is used as the key independent variable, while in column 2 I use the insurance coverage ratio instead. As can be seen from the table, the coefficients are significantly negative for the insurance measures alone, which is in line with the findings of Lin et al. (2011). However, the relation for insurance coverage ratio becomes significantly positive when cross-listing is taken into account. The same positive relation exists for the insurance indicator as well, but the results are not significant. The insignificance can be due to the fact that very high share of cross-listed firms purchase the insurance and therefore the number of firms not carrying the insurance is relatively small.

My results suggest that D&O insurance decision has an effect on acquirer returns: the impact is negative for non-cross-listed firms and positive for cross-listed firms. As firms that are not purchasing the insurance are included in the coverage ratio as zeros, the negative effect of the insurance purchase among non-cross-listed firms makes the negative coefficient larger (see Appendix D). The point estimates indicate that a one-standard-deviation increase in the insurance coverage ratio increases average acquirer CARs by 1.4% among cross-listed firms and decreases them by -0.7% among non-cross-listed firms, other things being equal. Hence, the effect of D&O insurance on CARs is opposite between these two groups and the effect appears both economically and statistically significant.

[6] See French's website (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\ library.html) for definitions.

Table 7: Regression of acquirer returns and D&O insurance coverage: Cross-listing

This table shows the results from OLS regressions of CAR (-2, +2) (%) on measures of D&O insurance use. The sample consists of 1,368 completed acquisitions made by firms listed in the Toronto Stock Exchange (TSX) between 2003 and 2013, subject to the availability of D&O insurance and stock price information, and the existence of the insurance. A dummy variable cross-listed (1/0) is used to separate firms that are cross-listed in one of the US stock exchanges (NYSE, Amex, or Nasdaq) from the other sample. Standard errors (clustered at the acquirer level) are used in computing *t*-statistics [in brackets]. *, **, ***: statistically significantly different from zero at the 0.10, 0.05, and 0.01 level (two-tailed), respectively. Standard errors are robust to both cross-sectional heteroskedasticity and within-firm serial correlation. The coefficients of the constant, year, and industry dummies are omitted for brevity. Variable definitions are in Appendix A.

	(1)	(2)
D&O insurance measures		
Insurance (1/0)	-3.977***	
	[-4.030]	
Insurance (1/0) x cross-listed (1/0)	0.396	
	[0.760]	
Insurance coverage ratio		-0.669***
		[-4.830]
Insurance coverage ratio x cross-listed (1/0)		7.767***
		[2.570]
Deal characteristics		
All-cash deal (1/0)	0.521	0.549
	[0.960]	[1.010]
Stock deal (1/0)	0.557	0.589
	[0.720]	[0.830]
Friendly deal (1/0)	1.554	1.389
	[1.780]	[1.630]
Unrelated deal (1/0)	0.153	0.165
	[0.370]	[0.420]
Private target (1/0)	-0.066	-0.262
	[-0.060]	[-0.230]
Subsidiary target (1/0)	0.196	0.100
	[0.170]	[0.090]
Public target (1/0)	-1.868	-1.902
	[-1.400]	[-1.420]
Year fixed-effects	Yes	Yes
Industry fixed-effects	Yes	Yes
Adjusted-R^2	0.007	0.029
Number of observations	1368	1368

6.2.3 Multivariate analysis: Additional control variables

In the previous section I showed that the results of my regression model of the relation between acquirer returns and D&O insurance are in line with Lin et al. (2011), and that cross-listing affects the results by turning the relation to be positive between D&O insurance coverage and acquirer returns. Now, I focus on the cross-listed firms and add more control variables (described in Section 5.2) to the model in Table 8: Acquirer characteristics in columns (1) and (3) and five deal types based on M&A currency and target ownership status from the acquisition classification scheme in columns (2) and (4). After adding these control variables, my sample size is 547 acquisitions for the insurance indicator and 454 acquisitions for the coverage ratio. Now, the empirical model is as follows:

$$CAR = f(D\&O\ insurance\ measure, Deal\ characteristics, \\ Acquirer\ characteristics, Deal\ types, Industry\ and\ time\ effects) \quad (9)$$

As can be seen from the column (3) of Table 8, adding firm characteristics as control variables do not reduce the significance of the relation between D&O insurance coverage ratio and acquirer returns. The *t*-statistics of the insurance coverage ratio is 4.29 in column (3). Hence, the effect of D&O insurance coverage ratio on acquirer CARs is statistically significant. As it was the case in the univariate analysis (see Appendix D), insurance indicator in column (1) does not have significant relationship with acquirer returns. Again, a large share of cross-listed firms purchase D&O insurance, which can explain the insignificance of the results.

In columns (2) and (4) in Table 8, I add the acquisition classification scheme introduced by Masulis et al. (2007). I decompose my sample into five deal types based on M&A currency and target ownership status. As mentioned in the Section 5.2.8, I exclude the subsidiary stock deal indicator from the original six deal types to avoid perfect multicollinearity with the regression intercept. The decomposition of deal types yields to higher explanatory power of my model: The adjusted-R^2 for the D&O insurance coverage ratio increases from 5.3% in column (2) to 8.5% in column (4). The *t*-statistics of the D&O insurance coverage ratio increases to 4.52 in column (4). Hence, the effect of D&O insurance on acquirer CARs remains statistically significant.

For my control variables, acquirer size has significantly negative effect on acquirer returns in column (1), which is in line with the findings of Moeller et al. (2004). Stock deal has a significant positive relation with the acquirer returns in column (2), and deal types including public targets with both financing types have significant negative relations with acquirer returns in columns (2) and (4). My results are in line with Masulis et al. (2007) and the prior literature.

Table 8: Regression of acquirer returns and D&O insurance coverage: Additional controls

This table shows the results from OLS regressions of CAR (-2, +2) (%) on measures of D&O insurance use. The sample consists of 547 completed acquisitions made by firms listed in the Toronto Stock Exchange (TSX) and cross-listed in one of the US stock exchanges (NYSE, Amex, or Nasdaq) between 2003 and 2013, subject to the availability of D&O insurance and stock price information. The regressions control for deal and acquirer characteristics, deal types, and year and industry fixed-effects. Standard errors (clustered at the acquirer level) are used in computing *t*-statistics [in brackets]. *, **, ***: statistically significantly different from zero at the 0.10, 0.05, and 0.01 level (two-tailed), respectively. Standard errors are robust to both cross-sectional heteroskedasticity and within-firm serial correlation. The coefficients of the constant, year, and industry dummies are omitted for brevity. Variable definitions are in Appendix A.

	(1)	(2)	(3)	(4)
D&O insurance measures				
Insurance (1/0)	1.130	1.241		
	[1.400]	[1.460]		
Insurance coverage ratio			10.820***	11.182***
			[4.290]	[4.520]
Deal characteristics				
All-cash deal (1/0)	0.237	1.953	0.088	0.561
	[0.380]	[0.620]	[0.140]	[0.200]
Stock deal (1/0)	1.522	5.679**	1.068	5.167*
	[1.400]	[2.020]	[0.950]	[1.740]
Friendly deal (1/0)	0.424	0.603	0.471	0.703
	[0.440]	[0.660]	[0.490]	[0.760]
Unrelated deal (1/0)	-0.071	-0.175	-0.165	-0.334
	[-0.110]	[-0.270]	[-0.240]	[-0.003]
Private target (1/0)	0.259	1.029	-0.298	0.069
	[0.150]	[0.390]	[-0.180]	[0.030]
Subsidiary target (1/0)	0.281	1.015	0.082	0.362
	[0.160]	[0.360]	[0.050]	[0.140]
Public target (1/0)	-2.387	3.650	-2.551	3.971
	[-1.340]	[1.180]	[-1.470]	[1.260]
Acquirer characteristics				
Leverage	0.009	0.004	-0.007	-0.015
	[0.450]	[0.180]	[-0.420]	[-0.900]
Log(assets)	-0.441**	-0.348*	-0.127	-0.008
	[-2.070]	[-1.680]	[-0.580]	[-0.040]
Tobin's *q*	-0.337	-0.310	-0.351	-0.356
	[-1.180]	[-1.090]	[-1.260]	[-1.280]
FCF	-0.101	-0.090	0.773	0.720
	[-0.110]	[-0.100]	[1.200]	[1.130]
Market-to-book	-0.035	-0.073	0.091	0.073
	[-0.330]	[-0.650]	[0.960]	[0.740]
Stock price run-up (%)	-0.990	-0.837	-0.683	-0.539
	[-1.590]	[-1.300]	[-1.080]	[-0.840]
Deal types				
Public target (1/0) x stock deal (1/0)		-10.583***		-11.634***
		[-3.280]		[-3.220]
Public target (1/0) x all-cash deal (1/0)		-6.094*		-5.947*
		[-1.690]		[-1.670]
Private target (1/0) x stock deal (1/0)		-2.553		-2.774
		[-0.780]		[-0.850]
Private target (1/0) x all-cash deal (1/0)		-1.206		0.294
		[-0.380]		[0.100]
Subsidiary target (1/0) x all-cash deal (1/0)		-2.390		-0.997
		[-0.730]		[-0.340]
Year fixed-effects	Yes	Yes	Yes	Yes
Industry fixed-effects	Yes	Yes	Yes	Yes
Adjusted-R^2	0.020	0.048	0.054	0.085
Number of observations	547	547	454	454

6.2.4 Instrumental variables approach

Any study dealing with the interaction between governance structure and firm decision making can have endogeneity issues. In my study the primary dependent variable in my tests is a short-term market-based measure and thus endogeneity might be less of a problem relative to other studies in the literature. Nevertheless, firms with D&O insurance can have firm-specific characteristics that I have thus far failed to account for and which can affect the D&O insurance purchase decision and the quality of acquisition decisions. I attempt to address this issue using an instrumental variable approach.

Following the recent literature (Adams, Lin, and Zou, 2011; Lin, Ma Malatesta, and Xuan (2011); Lin et al., 2011), I use the industry average D&O insurance incidence and median coverage ratio as instruments for the firm's D&O insurance incidence and coverage ratio, respectively. There are two rationales for using these instrument variables. First, as Adams et al. (2011) point out, it is possible that firms in the same industry and/or region compete for the same directors in the local labor market. When firms are competing for most talented directors, their directorial compensation packages (e.g. including D&O insurance coverage) can be influenced by the compensation packages offered by competitors in the same industry of region. Second, firms in the same industry face similar business risks and business cycles, which mean that the risk of facing shareholder litigation often follows industry patterns. As a result, industry average/median D&O insurance policy will be correlated with a firm's D&O insurance coverage but it is unlikely to influence the quality of a firm's acquisitions in any other way than through the firm's D&O insurance plan (see: Lin et al., 2011).

In the instrumental variable approach, I run a first-stage regression with the D&O insurance indicator variable and the continuous variable as the dependent variable. These regressions are not reported for brevity. The key instrumental variable for the former is the industry average of the D&O insurance indicator variable and the key instrumental variable for the latter is the industry median D&O insurance coverage ratio. In both cases, the first-stage instrument variable regressions include all the control variables from Table 8. I use the fitted values from these first-stage regressions as explanatory variables in the second-stage regressions in Table 9, in which the D&O insurance indicator is reported in column (1) and the D&O insurance coverage ratio in column (2).

Table 9: Instrumental variables approach

This table shows the results of second-stage regressions between CAR (-2, +2) (%) and instruments for D&O insurance use. The sample consists of 487 completed acquisitions made by firms listed in the Toronto Stock Exchange (TSX) and cross-listed in one of the US stock exchanges (NYSE, Amex, or Nasdaq) between 2003 and 2013, subject to the availability of D&O insurance and stock price information. The regressions control for deal and acquirer characteristics, deal types, and year and industry fixed-effects. The insurance indicator is instrumented with fitted values from a first-stage regression on industry mean insurance incidence and the insurance coverage ratio is instrumented with industry median coverage based on Fama-French 30 industries and control variables. Shea's (1997) partial R^2 is a measure of instrument variable relevance. First-stage *F*-test is the test of excluded IV in the first-stage regression. Standard errors are used in computing *t*-statiscs [in brackets], and they are clustered at the acquirer level, robust to both cross-sectional heteroskedasticity and within-firm serial correlation. *, **, ***: statistically significantly different from zero at the 0.10, 0.05, and 0.01 level (two-tailed), respectively. Standard errors are robust to both cross-sectional heteroskedasticity and within-firm serial correlation. The coefficients of the constant, year, and industry dummies are omitted for brevity. Variable definitions are in Appendix A.

	(1)	(2)
D&O insurance measures		
Insurance (1/0)	2.500	
	[1.530]	
Insurance coverage ratio		22.800***
		[8.540]
Deal characteristics		
All-cash deal (1/0)	1.500	0.300
	[0.520]	[0.100]
Stock deal (1/0)	5.000	5.300*
	[1.730]	[1.770]
Friendly deal (1/0)	0.900	0.800
	[1.100]	[1.020]
Unrelated deal (1/0)	-0.100	-0.700
	[-0.140]	[-0.970]
Private target (1/0)	0.400	-0.500
	[0.170]	[-0.200]
Subsidiary target (1/0)	0.500	-0.300
	[0.180]	[-0.100]
Public target (1/0)	3.800	3.500
	[1.240]	[1.120]
Acquirer characteristics		
Leverage	0.000	-0.000
	[0.550]	[-1.230]
Log(assets)	-0.300	0.400**
	[-1.500]	[2.120]
Tobin's *q*	-0.400	-0.200
	[-1.520]	[-0.850]
FCF	0.600	0.800
	[0.990]	[1.350]
Market-to-book	0.000	0.200
	[0.100]	[1.510]
Stock price run-up (%)	-0.700	-0.500
	[-1.060]	[-0.790]
Deal types		
Public target (1/0) x stock deal (1/0)	-10.600***	-12.000***
	[-3.010]	[-3.250]
Public target (1/0) x all-cash deal (1/0)	-6.700*	-6.100*
	[-1.870]	[-1.770]
Private target (1/0) x stock deal (1/0)	-1.300	-3.400
	[-0.390]	[-1.020]
Private target (1/0) x all-cash deal (1/0)	-1.200	0.200
	[-0.380]	[0.070]
Subsidiary target (1/0) x all-cash deal	-1.700	-0.800
	[-0.540]	[-0.280]
Year fixed-effects	Yes	Yes
Industry fixed-effects	Yes	Yes
First-stage Shea's partial R^2	0.284	0.528
First-stage F-test (p-value)	0.000	0.000
Second-stage adjusted-R^2	0.074	0.080
Number of observations	487	487

In Table 9, the *p*-values of relevant *F*-tests of industry average D&O insurance incidence or the industry median coverage ratio as the excluded instrument are highly significant. I also calculate Shea's (1997) partial R^2 from the first-stage regressions for both the indicator and continuous D&O insurance variables, and these values well exceed the suggested hurdle of 10% indicating that my instrument variables are relevant in explaining the variation of the potentially endogenous regressors. These results suggest that the empirical results are robust after the instrumentation. Both variables have positive relation with acquirer returns and the effect of D&O insurance coverage ratio on acquirer returns remains statistically significant.

6.3 D&O insurance premium and acquirer returns

In this section, I use the sample of cross-listed firms for my analysis on the relation between D&O insurance premium and acquirer returns. Table 10 shows the summary statistics for variables used in this section, including two corporate governance indexes.

Table 10: Summary statistics of D&O insurance premium

This table presents summary statistics for the variables used in the analysis. The sample consists of 571 completed acquisitions made by firms that were listed in the Toronto Stock Exchange and cross-listed in one of the US stock exchanges (NYSE, Amex or Nasdaq) between 2003 and 2013, subject to the availability of D&O insurance, corporate governance index, and stock price information. Variable definitions are in Appendix A.

			Percentiles			
Variable	Mean	Std. dev	25th	50th	75th	*N*
Governance measures						
Log(per dollar premium)	-12.173	2.096	-13.729	-3.593	-10.540	411
GMI index	72.903	14.210	62.000	71.000	86.000	422
BSCI index	67.348	22.147	50.000	75.000	88.000	424
Acquirer return						
CAR (-2, +2) (%)	0.534	6.289	-2.467	0.232	3.142	571
Acquisition premiums						
Acquisition premium_4w (%)	47.076	84.195	15.240	38.750	62.400	65
Deal characteristics						
All-cash deal (1/0)	0.222	0.416	0.000	0.000	0.000	571
Stock deal (1/0)	0.170	0.376	0.000	0.000	0.000	571
Friendly deal (1/0)	0.965	0.184	1.000	1.000	1.000	571
Relative size	0.329	1.470	0.013	0.041	0.164	342
Unrelated deal (1/0)	0.320	0.467	0.000	0.000	1.000	571
Private target (1/0)	0.438	0.497	0.000	0.000	1.000	571
Public target (1/0)	0.189	0.392	0.000	0.000	0.000	571
Subsidiary target (1/0)	0.354	0.479	0.000	0.000	1.000	571
Both high tech (1/0)	0.217	0.413	0.000	0.000	0.000	571
Acquirer characteristics						
Log(assets)	14.457	2.227	13.049	14.401	16.190	551
Market-to-book	2.136	2.726	0.800	1.680	2.550	541
Leverage	25.221	21.602	1.935	25.080	38.860	567
Tobin Q	1.895	1.446	1.162	1.515	2.011	563
Stock price run-up (%)	0.051	0.432	-0.167	0.011	0.190	571
FCF	-0.036	0.311	-0.084	0.029	0.085	531

6.3.1 Univariate analysis

Before conducting regression analysis in the next section, I first take an initial look at univariate statistics to see if there are any broad patterns in the data about the relation between acquisition returns and proxies for the quality of corporate governance: D&O insurance premium, GMI index, and BSCI index. I split the sample into subgroups of firms with below and above median values of these proxies and compare the mean values of acquirer CARs, acquirer premiums, and variety of deal characteristics. The results are presented in Table 11.

In Table 11, Panel A presents the univariate statistics of D&O insurance premium variable Log(per dollar premium), Panel B the univariate statistics of GMI index, and Panel C the univariate statistics of BSCI index. As can be seen from the table, the Low per dollar premium group (firms paying less for their D&O insurance coverage on average), experience significantly higher CARs than firms in the High per dollar group. The difference between the CARs of the two groups is about 1.9%. In this sample, firms in the Low per dollar group also pay less for their targets than firms in the High per dollar group, but the difference is not statistically significant. There is no statistical significance between acquirer returns or premiums with either of the governance indexes.

Regarding deal characteristics, I observe that firms in the Low per dollar premium group make more acquisitions financed by cash (moderate statistical significance in difference) and they acquire significantly more private targets than firms in the High per dollar premium group. Both of these factors are typically associated with positive acquirer returns in the prior literature. Furthermore, firms in the Low per dollar group make significantly less unrelated deals and target significantly less public firms that are typically associated with negative acquirer returns in the prior literature. On the other hand, firms in the Low per dollar premium group target significantly less subsidiaries and they make significantly more deals between two high tech firms, which are typically associated with positive acquirer returns. The only significant difference between low and high governance index subgroups is that firms low governance index firms make significantly more unrelated deals. The same relation exists for both governance indexes.

Table 11: Univariate analysis of D&O insurance premium and governance indexes

This table presents univariate statistics for 411 completed acquisitions made by firms listed in the Toronto Stock Exchange (TSX) and cross-listed in one of the US stock exchanges (NYSE, Amex, or Nasdaq) between 2003 and 2013, subject to the availability of D&O insurance, corporate governance index, and stock price information. The table reports averages of acquirer abnormal announcement returns, acquisitions premiums, and deal characteristics divided into above median and below median subsamples for D&O insurance premium (Panel A), Globe and Mail Governance Index (GMI, Panel B), and Board Shareholder Confidence Index (BSCI, Panel C). Log(Per dollar premium) is the natural logarithmic transformation of per dollar D&O insurance premium. *p*-values are from two-tailed *t*-tests. *,**,***: statistically significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively. Variable definitions are in Appendix A.

Panel A: Log(per dollar premium)

	Low per dollar premium		High per dollar premium			
Variable	Mean	*N*	Mean	*N*	Difference	*p*-value
Acquirer return						
CAR (-2, +2) (%)	1.509	206	-0.439	205	1.948***	0.00
Acquisition premiums						
Acquisition premium_4w (%)	38.198	18	50.414	12	-12.216	0.46
Deal characteristics						
All-cash deal (1/0)	0.194	206	0.268	205	-0.074*	0.08
Stock deal (1/0)	0.146	206	0.137	205	0.009	0.79
Relative size	0.403	100	0.097	144	0.306***	0.00
Unrelated deal (1/0)	0.296	206	0.420	205	-0.123***	0.01
Private target (1/0)	0.602	206	0.298	205	0.304***	0.00
Public target (1/0)	0.146	206	0.229	205	-0.084**	0.03
Subsidiary target (1/0)	0.252	206	0.429	205	-0.177***	0.00
Both high tech (1/0)	0.340	206	0.137	205	0.203***	0.00

Panel B: GMI index

	High index		Low index			
Variable	Mean	*N*	Mean	*N*	Difference	*p*-value
Acquirer return						
CAR (-2, +2) (%)	0.447	140	0.372	140	0.075	0.92
Acquisition premiums						
Acquisition premium_4w (%)	53.263	12	29.560	9	23.703	0.25
Deal characteristics						
All-cash deal (1/0)	0.271	140	0.207	140	0.064	0.21
Stock deal (1/0)	0.114	140	0.121	140	-0.007	0.85
Relative size	0.235	84	0.133	79	0.102	0.25
Unrelated deal (1/0)	0.400	140	0.257	140	0.143**	0.01
Private target (1/0)	0.471	140	0.414	140	0.057	0.34
Public target (1/0)	0.164	140	0.207	140	-0.043	0.36
Subsidiary target (1/0)	0.357	140	0.357	140	0.000	1.00
Both high tech (1/0)	0.257	140	0.207	140	0.050	0.32

Panel C: BSCI index

	High index		Low index			
Variable	Mean	*N*	Mean	*N*	Difference	*p*-value
Acquirer return						
CAR (-2, +2) (%)	0.076	140	0.710	141	0.633	0.40
Acquisition premiums						
Acquisition premium_4w (%)	53.740	11	31.406	10	-22.334	0.26
Deal characteristics						
All-cash deal (1/0)	0.279	140	0.206	141	-0.073	0.15
Stock deal (1/0)	0.114	140	0.128	141	0.013	0.73
Relative size	0.251	89	0.105	76	-0.146	0.09
Unrelated deal (1/0)	0.386	140	0.277	141	-0.109*	0.05
Private target (1/0)	0.443	140	0.447	141	0.004	0.95
Public target (1/0)	0.171	140	0.199	141	0.027	0.56
Subsidiary target (1/0)	0.379	140	0.333	141	-0.045	0.43
Both high tech (1/0)	0.264	140	0.199	141	-0.066	0.19

6.3.2 Multivariate analysis: Deal characteristics

In this section, I conduct regression analysis to compare the explanatory power of D&O insurance premium on acquirer returns to GMI and BSCI governance indexes and test their relevance to work as a proxy for the corporate governance quality. Masulis et al. (2007) use two different corporate governance indexes and staggered board variable as proxies for the quality of corporate governance in their study of corporate governance and acquirer returns. In this study, I replace staggered board variable with a D&O insurance premium measure to compare its ability to explain CARs to corporate governance indexes. The main empirical model is:

$$CAR = f(\text{Proxy for governance quality}, \text{Deal characteristics}, \text{Time effects}) \qquad (10)$$

In Eq. (10), the dependent variable is the acquirer's five-day CAR (-2, +2) around acquisition announcement date. The independent variables are the D&O insurance premium variable and two corporate governance indexes: The natural logarithmic transformation of per dollar D&O insurance premium (*Log(per dollar premium*), Board Shareholder Confidence Index (*BSCI index*), and Globe and Mail Governance Index (*GMI index*). The results from ordinary least squares (OLS) regressions of Eq. (10) are presented in Table 12, controlling for year dummies, and deal characteristics described in Section 5.2. Acquirer characteristics and deal types will be added to regression in the following section. The *t*-statistics are adjusted for heteroskedasticity and acquirer clustering.

As can be seen from Table 12, higher D&O insurance premium has significant negative relation with CARs, suggesting that the D&O insurance premium includes valuable information for investors on the quality of corporate governance structures. More specifically, the point estimate in column (1) indicates that a one-standard-deviation increase in the natural logarithmic transformation of per dollar premium reduces CARs by 0.9%, suggesting that the results are both economically and statistically significant. On the other hand, both of the two corporate governance indexes have insignificant relation with the acquirer returns.

For my control variables, all the three target types have moderate statistical significance in at least one of the regressions and they are in line with prior literature. Other control variables have insignificant effect on acquirer returns at this point.

Table 12: Regression of acquirer returns and governance quality: Deal characteristics

This table presents results from OLS regressions of CAR (-2, +2) (%) on measures of corporate governance quality. The sample consists of 411 completed acquisitions made by firms listed in the Toronto Stock Exchange (TSX) and cross-listed in one of the US stock exchanges (NYSE, Amex, or Nasdaq) between 2003 and 2013, subject to the availability of D&O insurance, corporate governance index, and stock price information. Log(Per dollar premium) is the natural logarithmic transformation of per dollar D&O insurance premium, and GMI and BSCI are corporate governance indexes. The regressions control for deal characteristics and year fixed-effects. Standard errors (clustered at the acquirer level) are used in computing *t*-statistics [in brackets]. *, **, ***: statistically significantly different from zero at the 0.10, 0.05, and 0.01 level (two-tailed), respectively. Standard errors are robust to both cross-sectional heteroskedasticity and within-firm serial correlation. The coefficients of the constant and year dummies are omitted for brevity. Variable definitions are in Appendix A.

	(1)	(2)	(3)
Governance measures			
Log(per dollar premium)	-0.400**		
	[2.490]		
GMI index		-0.013	
		[-0.510]	
BSCI index			-0.007
			[-0.450]
Deal characteristics			
All-cash deal (1/0)	0.600	0.400	0.400
	[0.750]	[0.300]	[0.330]
Stock deal (1/0)	1.600	2.800	2.700
	[1.200]	[1.240]	[1.250]
Unrelated deal (1/0)	0.100	-0.400	-0.500
	[0.080]	[-0.460]	[-0.530]
Subsidiary target (1/0)	0.300	2.600	2.600*
	[0.350]	[1.860]	[1.910]
Private target (1/0)	0.100	2.100*	2.000*
	[0.070]	[1.710]	[1.660]
Public target (1/0)	-2.600*	-0.800	-0.800
	[-1.940]	[-0.440]	[-0.420]
High tech (1/0)	-0.200	0.400	0.300
	[-0.180]	[0.300]	[0.240]
Year fixed-effects	Yes	Yes	Yes
Adjusted-R^2	0.023	0.018	0.018
Number of observations	411	280	281

6.3.3 Multivariate analysis: Acquirer characteristics and deal types

The results in the previous section suggest that there is a significant negative relation between D&O insurance premium and acquirer returns, and there is no significant relation between either of the two governance indexes and acquirer returns. In this section, I add acquirer characteristics and five deal types based on M&A currency and target ownership status from the acquisition classification scheme to the model. Now, the empirical model is as follows:

$$CAR = f(Proxy\ for\ governance\ quality, Deal\ characteristics, Acquirer\ characteristics, Deal\ types, Time\ effects) \quad (11)$$

The results are presented in Table 13, columns (1), (3), and (5) covering deal and acquirer characteristics and columns (2), (4), and (6) adding deal types to the model. As can be seen from the columns (1) and (2), adding firm characteristics as control variables do not reduce the significance of D&O insurance premium variable in explaining acquirer returns. Also, the relation between the two corporate governance indexes and CARs remain insignificant. For the control variables, public target has significance in explaining CARs. However, it has negative effect in the D&O insurance premium regression and positive effect in both corporate governance indexes regressions. FCF has moderately significant positive relation and stock price run up has significant negative relation with CARs in corporate governance indexes regressions. Other control variables have insignificant effect on acquirer returns.

Adding the acquisition classification scheme to the model does not change the results. The negative relation between D&O insurance premium and acquirer returns remain statistically significant with these new control variables in column (2), and the relation between the two corporate governance indexes and CARs remain insignificant in columns (4) and (6). The decomposition to different deal types yields to higher explanatory power of my model for all regressions. The adjusted-R^2 for D&O insurance premium in column (1) is 1.1% and in column (2) it is 6.7%.

For the control variables, there is significant positive relation between stock deals and acquirer returns in BSCI index regression in column (6), and the same relation is moderately significant in D&O insurance premium and GMI index regressions in columns (2) and (4). Public target has a significant positive relation with the acquirer returns and the positive effect of FCF remains moderately significant in the regressions of corporate governance indexes. Furthermore, the negative relation between stock price run-up and CARs in the governance indexes regressions becomes now less significant. Other control variables are insignificant in explaining acquirer returns.

Table 13: Regression of acquirer returns and governance quality: Additional controls

This table presents results from OLS regressions of CAR (-2, +2) (%) on measures of corporate governance quality. The sample consists of 361 completed acquisitions made by firms listed in the Toronto Stock Exchange (TSX) and cross-listed in one of the US stock exchanges (NYSE, Amex, or Nasdaq) between 2003 and 2013, subject to the availability of D&O insurance, corporate governance index, and stock price information. Log(Per dollar premium) is the natural logarithmic transformation of per dollar D&O insurance premium, and GMI and BSCI are corporate governance indexes. Regressions in columns (1), (3), and (5) control for deal and acquirer characteristics, and regressions in columns (2), (4), and (6) add deal types to the model. Standard errors (clustered at the acquirer level) are used in computing *t*-statistics [in brackets]. *, **, ***: statistically significantly different from zero at the 0.10, 0.05, and 0.01 level (two-tailed), respectively. Standards errors are robust to both cross-sectional heteroskedasticity and within-firm serial correlation. The coefficients of the constant, and year dummies are omitted for brevity. Variable definitions are in Appendix A.

	(1)	(2)	(3)	(4)	(5)	(6)
Governance measures						
Log(per dollar premium)	-1.025**	-1.045**				
	[2.170]	[2.170]				
GMI index			-0.023	-0.026		
			[-0.730]	[-0.800]		
BSCI index					-0.013	0.000
					[-0.750]	[-0.860]
Deal characteristics						
All-cash deal (1/0)	-0.009	-0.527	-0.589	0.218	-0.582	0.001
	[-0.010]	[-0.290]	[-0.540]	[0.100]	[-0.540]	[0.040]
Stock deal (1/0)	1.402	8.622*	2.286	11.446*	2.017	0.112**
	[0.980]	[1.970]	[0.960]	[2.060]	[0.870]	[2.060]
Unrelated deal (1/0)	-0.433	-0.575	-0.669	-0.824	-0.702	-0.008
	[-0.490]	[-0.670]	[-0.680]	[-0.800]	[-0.710]	[-0.830]
Subsidiary target (1/0)	-0.057	-0.540	2.323	2.245	2.370	0.022
	[-0.050]	[-0.370]	[1.650]	[1.160]	[1.750]	[1.180]
Private target (1/0)	-0.182	-0.444	1.842	1.977	1.670	0.017
	[-0.160]	[-0.300]	[1.530]	[1.230]	[1.450]	[1.090]
Public target (1/0)	-2.669*	3.458	-0.072	6.541**	-0.018	0.066**
	[-1.810]	[1.480]	[-0.040]	[2.040]	[-0.010]	[2.090]
High tech (1/0)	0.293	0.266	0.706	0.627	0.458	0.004
	[0.250]	[0.230]	[0.520]	[0.470]	[0.370]	[0.340]
Acquirer characteristics						
Leverage	-0.002	-0.011	0.011	0.004	0.009	0.000
	[-0.120]	[-0.540]	[0.480]	[0.210]	[0.380]	[0.120]
Log(assets)	0.688	0.836	-0.082	0.124	-0.124	0.001
	[1.360]	[1.660]	[-0.350]	[0.570]	[-0.510]	[0.310]
FCF	1.210	1.001	1.455*	1.234*	1.468*	0.013*
	[1.590]	[1.460]	[1.810]	[1.710]	[1.810]	[1.710]
Market-to-book	0.074	0.080	0.081	0.013	0.090	0.000
	[0.980]	[1.010]	[0.620]	[0.100]	[0.670]	[0.230]
Stock price run-up (%)	-0.947	-0.731	-1.673**	-1.266*	-1.669**	-0.013*
	[-1.230]	[-0.960]	[-2.320]	[-1.600]	[-2.310]	[-1.700]
Deal types						
Public target (1/0) x stock deal (1/0)		-15.108***		-18.041***		-0.181***
		[-3.140]		[-2.600]		[-2.740]
Public target (1/0) x all-cash deal (1/0)		-5.505*		-6.069		-0.061
		[-1.900]		[-1.500]		[-1.530]
Private target (1/0) x stock deal (1/0)		-6.527		-7.399		-0.079
		[-1.460]		[-1.200]		[-1.400]
Private target (1/0) x all-cash deal (1/0)		1.897		0.229		0.005
		[0.830]		[0.070]		[0.160]
Subs. target (1/0) x all-cash deal (1/0)		0.057		-1.815		-0.016
		[0.020]		[-0.600]		[-0.530]
Year fixed-effects	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted-R^2	0.011	0.067	0.013	0.095	0.011	0.094
Number of observations	361	361	252	252	253	253

6.3.4 Sensitivity test

In this section, I follow Masulis et al. (2007) and conduct a sensitivity test to my results in previous sections. In other words, I use a dummy variable approach and classify acquirers as dictatorship versus democracy firms based on the three variables, respectively. Specifically, I define the dummy variables *Dictatorship Log(per dollar premium)*, *Dictatorship GMI index*, and *Dictatorship BSCI index* to be equal to one for acquirers with an above-median values of each variable, and zero otherwise. I re-estimate the acquirer return regressions in Table 13 after replacing continuous variables with these new dummy variables, and report the coefficient estimates in Table 14.

The results in column (1) of Table 14 show that acquirers in the dictatorship portfolio based on the D&O insurance premium experience significantly lower CARs than firms in the below median group. The results in columns (2) and (3) show that relations between dictatorship portfolios based on the two governance indexes and acquirer returns are not significant. The results in all three columns are in line with the results of previous regressions and support my findings.

Table 14: Dummy variables approach

This table presents results from OLS regressions of CAR (-2, +2) (%) on dummy variables derived from measures of corporate governance quality. The sample consists of 361 completed acquisitions made by firms listed in the Toronto Stock Exchange (TSX) and cross-listed in one of the US stock exchanges (NYSE, Amex, or Nasdaq) between 2003 and 2013, subject to the availability of D&O insurance, corporate governance index, and stock price information. Firms with above-median values of three governance variables are denoted as dictatorship firms: Dictatorship Log(per dollar premium), Dictatorship Globe and Mail Governance Index (GMI), and Dictatorship Board Shareholder Confidence Index (BSCI). Based on the dictatorship classification, a dummy variable is defined to be equal to one for firms that are dictatorship firms, and zero otherwise. Standard errors (clustered at the acquirer level) are used in computing *t*-statistics [in brackets]. *, **, ***: statistically significantly different from zero at the 0.10, 0.05, and 0.01 level (two-tailed), respectively. Standard errors are robust to both cross-sectional heteroskedasticity and within-firm serial correlation. The coefficients of the constant, and year dummies are omitted for brevity. Variable definitions are in Appendix A.

	(1)	(2)	(3)
Governance measures			
Dictatorship Log(per dollar premium)	-2.395		
	[2.070]		
Dictatorship GMI index		-0.427	
		[-0.580]	
Dictatorship BSCI index			-0.723
			[-1.040]
Deal characteristics			
All-cash deal (1/0)	-1.244	-0.695	-0.781
	[-0.740]	[-0.250]	[-0.290]
Stock deal (1/0)	8.415	5.711	5.675
	[1.960]	[1.620]	[1.610]
Unrelated deal (1/0)	-0.369	-0.566	-0.518
	[-0.460]	[-0.700]	[-0.650]
Subsidiary target (1/0)	-0.465	-1.009	-0.968
	[-0.330]	[-0.380]	[-0.370]
Private target (1/0)	-0.839	-0.832	-0.857
	[-0.550]	[-0.330]	[-0.340]
Public target (1/0)	3.716	1.923	2.219
	[1.650]	[0.530]	[0.620]
High tech (1/0)	0.256	-0.077	-0.215
	[0.210]	[-0.080]	[-0.240]
Deal types			
Public target (1/0) x stock deal (1/0)	-15.026	-10.584	-10.787
	[-3.170]	[-2.240]	[-2.300]
Public target (1/0) x all-cash deal (1/0)	-5.095	-3.297	-3.396
	[-1.830]	[-0.840]	[-0.870]
Private target (1/0) x stock deal (1/0)	-5.977	-3.170	-3.394
	[-1.380]	[-0.890]	[-0.960]
Private target (1/0) x all-cash deal (1/0)	2.770	0.458	0.710
	[1.280]	[0.150]	[0.240]
Subsidiary target (1/0) x all-cash deal (1/0)	0.617	-0.576	-0.309
	[0.280]	[-0.190]	[-0.100]
Acquirer characteristics			
Leverage	-0.009	0.002	0.003
	[-0.510]	[0.130]	[0.170]
Log(assets)	0.305	-0.029	-0.053
	[1.040]	[-0.150]	[-0.270]
FCF	1.322	0.328	0.299
	[1.750]	[0.450]	[0.410]
Market-to-book	-0.014	-0.106	-0.092
	[-0.150]	[-0.940]	[-0.860]
Stock price run-up (%)	-0.575	-1.138	-1.105
	[-0.780]	[-1.770]	[-1.730]
Year fixed-effects	Yes	Yes	Yes
Adjusted-R^2	0.061	0.020	0.025
Number of observations	361	253	252

7. Discussion of results

In this section, I link the results of my analysis in Section 6. to the theoretical literature in Section 2. I provide my research questions and a brief overview of my results in Table 15 and discuss their implications both to the academic literature as well as to the investing public. I discuss D&O insurance information disclosure in regulators perspective and economic implications of my results.

Table 15: Summary of empirical findings

Original research question	Empirical finding
1. Is there a difference in the amount of D&O insurance coverage between firms listed only in Canada and firms cross-listed in the US?	Firms that are cross-listed are more likely to buy D&O insurance protection and they carry higher coverage limits.
2. Is there a difference in M&A activity of firms with low and high D&O insurance coverage between cross-listed and non-cross-listed firms?	The indirect evidence of this study suggests that cross-listed firms with low D&O insurance coverage make relatively fewer acquisitions than non-cross-listed firms with low coverage. Reduced M&A activity among cross-listed firms with low coverage can be an indication of an underinvestment problem.
3. Is there a difference in the impact of D&O insurance coverage on acquirer returns between non-cross-listed firms and firms cross-listed in the US?	Firms listed only in Canada experience negative acquirer returns and firms cross-listed in the US experience positive acquirer returns when their D&O insurance coverage increases.
4. Can D&O insurance premium explain acquirer returns and thus be used as a proxy for the quality of corporate governance?	D&O insurance premium has a significant negative relation with acquirer returns.
5. Which one of the variables, D&O insurance premium or the two governance indexes, has the strongest explanatory power of acquirer returns?	D&O insurance premium has the strongest explanatory power. The two benchmark governance indexes do not have significant relation with acquirer returns.

7.1 Legal implications

Regulators in many countries (e.g. the US, Finland, and Germany) do not require publicly listed firms to disclose their D&O insurance information. However, it is really common that firms are required to provide detailed information on other governance mechanisms, such as board characteristics, CEO experience and antitakeover provisions (ATPs). My results support recent studies that show the value

of D&O insurance information for outside investors in assessing risks related to governance structures of a firm. There is a lot of evidence that the amount of D&O insurance coverage a firm purchases affects the behavior of its management team. Furthermore, there is evidence that D&O insurance premium includes information that is not otherwise available in the market, and that it can be used as a better proxy for the quality of corporate governance than other measures available at the moment.

Therefore, my results have important policy implications in countries that do not require D&O insurance information disclosure. They are particularly important in the US, since my results take into account firms that are listed in there. My study provides empirical support for requiring firms to disclose their D&O insurance information, which Baker and Griffith (2007) have advocated for using qualitative evidence from extensive interviews and surveys, and Kang and Klausner (2011) by studying the relation between D&O insurance information and CEO overcompensation. Thus, as D&O insurance information signals the behavior of the management team and the quality of a firm's governance, it is logical to ask why this signal is not already being sent. Baker and Griffith (2007) suggest three possible reasons: Comparative information, free-riding and first mover disadvantage, and fear of attracting nuisance suits are the main concerns hindering the disclosure of D&O details.

First, they point out that the value of D&O policy information is purely comparative. Relevance of a firm's D&O insurance premium and payout limits emerges only upon comparison with similar firms. For example, by taking a broad industry-wise sample and controlling for variables such as market capitalization and volatility. My results support Kang and Klausner (2011) by showing that per dollar premium serves as a decent substitute for the quality of governance structure.

Second reason is that D&O insurance information could not be disclosed since each of the firms within an industry is disinclined to produce the information because of free rider effects. Investors of other firms cannot be charged for the information which is largely of value to them. Firms can also fear backlash from disclosing D&O details. When not placed in context, large amounts of D&O insurance expenses do not reflect well on the firm's management.

Finally and most importantly, firms fear that mandatory disclosure of D&O insurance details will encourage plaintiffs to file non-meritorious suits and seek to reach insurance assets. The possibility of these suits is the most common objection against the mandatory disclosure. However, according to Kang and Klausner (2011), it is unlikely that disclosure will change the dynamics of shareholder litigation. Plaintiffs' lawyers are well aware that average limits for firms with assets in excess of $100

million are in tens of millions of dollars and can estimate a firm's coverage within a fairly accurate range. Therefore, disclosure of details would not add anything substantial to lawyers' arsenals.

However, countries where D&O insurance information disclosure is now mandatory, such as Canada and the United Kingdom, overcame these same issues. The results of my study show a negative relation between D&O insurance coverage and acquirer returns for firms listed only in Canada, and a positive relation for firms cross-listed in the US. My study also shows a negative relation between D&O insurance premiums and quality of corporate governance. Thus, the opposite results relating to the D&O coverage in different markets and the unique information relating to the D&O insurance premium makes this a rich area for future research. Overall, a growing consensus inside and outside academia indicates that weak governance is costly to outside shareholders. This study shows that D&O insurance can be a valuable source of information, henceforth unavailable or unknown to the general investing public, to mitigate some of the costs associated with weak governance and to understand the effect of D&O insurance on the behavior of firm directors.

7.2 Economic implications of my research

The results of this study are valuable to both the investing public and firms themselves in their insurance purchases. First, I will discuss economic implications of the D&O insurance coverage results and then economic implications of the D&O insurance premium results.

7.2.1 Economic implications of D&O insurance coverage

My results show that firms listed only in Canadian stock market experience lower acquirer returns when they purchase higher D&O insurance coverage, which is in line with Lin et al. (2011). These results are consistent with the argument that D&O insurance in Canadian market induces unintended moral hazard on the part of directors and officers by shielding them from discipline of shareholder litigation. According to Lin et al. (2011), entrenched or poorly governed directors who are protected from shareholder discipline make poor decision about major corporate investments. They can pursue their own interest by adopting low-risk, self-serving operating strategies, which coincidentally redound to the benefit of firm bondholders. Also, according to Lin et al. (2013), in Canada lenders view D&O insurance coverage as increasing credit risk and higher levels of D&O insurance coverage are associated with greater risk taking and higher probabilities of financial restatement due to aggressive financial reporting.

However, my results are opposite for firms that are cross-listed in the US. Cross-listed firms that purchase higher D&O insurance coverage experience higher CARs than the ones with lower

coverage. It is therefore possible that higher D&O insurance protection can lead to more optimal risk-taking and board efficiency, when a firm is operating under US legislation and market environment. Thus, D&O insurance can work as an efficient contract between shareholders and directors. As my univariate results show, cross-listing itself cannot explain acquirer returns. However, it does have an effect on some acquirer and deal characteristics, but they cannot explain why cross-listed firms, opposite to non-cross-listed firms, experience higher CARs when their D&O insurance protection increases.

Possible explanations for the positive relation between D&O insurance coverage and acquirer returns of cross-listed firms can be looked from acquirer and deal characteristics between cross-listed firms that have high or low D&O insurance coverages. My results are mixed, since some of the characteristics related to high coverage are known to improve acquirer returns and some of them are known to reduce them. Furthermore, the mean market-to-book ratio of low coverage firms is significantly higher than the one of high coverage firms, meaning that their valuations are higher in the market. If low coverage firms would use more stock financing in their acquisitions, it could explain their lower CARs as they could be trying to benefit from their overvalued stock at the expense of shareholders. However, that is not the case in my results.

One possible explanation for the opposite results can be the differences between market characteristics of the US and Canada. The legal environment is more litigious in the US and thus low or inexistent D&O insurance protection puts directors and officers under higher personal legal risk in the US than it does in Canada. While class-action securities suits are common in the US, only very few have been brought in Canada so far. As Priest (1987) points out, more litigious legal environment in the US can increase the importance of D&O insurance in attracting higher quality risk-averse outside directors. Furthermore, cross-listed firms receive more analyst coverage, which means that the decisions directors make are more under the scope and their possibilities to make self-serving actions can be more difficult. Holderness (1990) state that D&O insurance could work better as a substitute for direct shareholder monitoring by relying on the insurer's screening mechanisms. It is possible that the screening mechanisms are more effective in the US than in Canada. Therefore, low D&O insurance protection can affect the behavior of directors and officers more in the US than it does in Canada. According to Boyer and Tennyson (2011), high liability exposure can cause an under-investment problem for firms with low D&O insurance coverage by inducing directors to be overly conservative and can cause them to forgo risky positive-NPV projects. If that was true, D&O insurance coverage can enhance board efficiency in the US rather than cause unintended moral hazard as it appears to do in Canada. The indirect evidence of M&A activity support the idea, but more

research is needed to find out whether it is the main source of the opposite results between cross-listed and non-cross-listed firms.

7.2.2 Economic implications of D&O insurance premium

My results suggest that D&O insurance premium contains information useful to investors. Also, my results suggest that the two most commonly used Canadian corporate governance indexes cannot explain acquirer returns. The direct evidence of Kang and Klausner (2011) suggest that US shareholders would find the independent assessment contained in D&O insurance premiums to be a useful summary of the likelihood of litigation associated with governance structures. Furthermore, their indirect evidence suggest that these same shareholders could use D&O insurance premium information as an additional tool for assessing the relative effectiveness of governance structures in maximizing shareholder returns. My study supports their results, as I find statistically significant negative relation between per dollar D&O insurance premium and acquirer returns. My results support the idea that firms fail to continually optimize their corporate governance, and firms with worse corporate governance pay more for their D&O insurance than firms with better governance. Therefore, investors can use D&O pricing as an accurate proxy to evaluate the quality of a firm's corporate governance.

Furthermore, when comparing the per dollar premium variable to two most commonly used Canadian corporate governance indexes, my results suggest that it has higher explanatory power of acquirer returns. Overall, either GMI or BSCI governance index does not have statistically significant relation with acquirer returns. This raises at least two questions: First, how is it possible that D&O insurance premium includes information that is not already available in the markets and not included in governance indexes? Second, why do governance indexes fail in doing what they are developed for?

The possible answer to the first question comes from the D&O insurance pricing process. Underwriters of insurance companies price D&O policies according to the risk posed by each prospective insured. However, in addition to performing only a basic financial analysis of the firm, underwriters focus a large part of their efforts on deep governance variables such as culture and character. These deep governance variables are not included in corporate governance indexes, and it is possible that they play an important part in evaluation of the quality of corporate governance. My findings support the idea that D&O insurance premium includes unique information on governance structures.

Second, why do corporate governance indexes fail? According to Klausner (2013), the meaning for governance indexes is that they try to measure the degree to which management is vulnerable to being replaced by shareholder action. Therefore, the elements of the indexes are seen as potential causes of management entrenchment. However, many elements of the indexes cannot cause entrenchment, and others that can cause entrenchment do so only under limited circumstances. As a result, each non-causal element in the index introduces a hook of spurious correlation or correlation with no potential causation.

Furthermore, Klausner (2013) suggests two related weaknesses in governance indexes. First, he mentions that they give equal weight to elements that have unequal impacts on entrenchment. It reflects a reasonable judgment that a degree of inaccuracy is a cost worth bearing for the virtue of tractability. However, indexes should not include elements that have a very low or highly contingent impact. Second, a related but more serious weakness is that they include many such elements. Specifically, indexes include elements that are problematic in the following ways: First, they have no impact on management entrenchment. Second, indexes have no impact on entrenchment if a firm has an effective staggered board. Third, they have an impact on entrenchment only under limited circumstances. Finally, indexes have no relevance to entrenchment and in fact no proven beneficial impacts on governance. In conclusion, problems with the structures and the lack of relevant information are probable reasons why governance indexes do not work well as proxies for the quality of corporate governance.

8. Conclusions

D&O insurance is common in North America, and especially valuable for the management teams of firms operating in the US where the legal environment is very litigious. It has become an important layer of protection for firm directors and officers against personal legal liabilities they can face because of the decisions they make on behalf of the firm. The empirical research on the effects of D&O insurance on the incentives of directors and officers, and the relation between D&O insurance premium and firm's governance structures have recently increased. However, the effects of the insurance on firms operating in the US are still under the shade due to the fact that D&O insurance information is not publicly available there.

My study sheds light on the effects of D&O insurance in the US by examining the relation between D&O insurance variables and acquirer returns with Canadian sample firms cross-listed in the US. First, I find that cross-listed firms are more likely to purchase D&O insurance and they carry higher coverage limits than firms listed only in Canada. Second, I find a significant negative relation between D&O insurance coverage and acquirer returns for firms listed only in Canada. The negative relation is in line with the prior literature. However, the relation becomes significantly positive when a firm is cross-listed in the US. The positive relation between D&O insurance coverage and acquirer returns of cross-listed firms mean that shareholders of those firms can benefit from the extensive D&O insurance protection. Third, I find that D&O insurance premium can be used as a proxy for the quality of corporate governance and that higher D&O insurance premium has a significant negative relation with acquirer returns. Finally, I find that D&O insurance premium has higher explanatory power of acquirer returns than two most commonly used Canadian corporate governance indexes. The higher explanatory power of D&O insurance premium indicates that it includes valuable information on governance structures that is not otherwise publicly available.

My results suggest that the effect of D&O insurance coverage on acquirer returns can vary between different markets. The negative relation among firms listed only in Canada indicates that D&O insurance can induce unintended moral hazard in firm managements by shielding them from the discipline of litigation. If that was the case, it is possible that entrenched or poorly governed directors who are protected from shareholder discipline make poor decisions about major corporate investments. On the other hand, the positive relation among cross-listed firms indicates that D&O insurance can lead to more optimal risk-taking and board efficiency. However, the indirect evidence of my study suggest that M&A activity of cross-listed firms with low D&O insurance protection can be affected by the more litigious US legislation. Hence, the positive relation between acquirer returns

and D&O insurance coverage among cross-listed firms with low coverage can be a result of an under-investment problem.

The fact that D&O insurance can have opposite effects on acquirer returns in different market areas leaves room for future research. The possibility to use cross-listing helps to study market areas that have been out of reach due to limitations on the availability of D&O insurance information. Furthermore, cross-listing approach provides various ways to study the effects of D&O insurance on firms operating in the US. For example, the relation between D&O insurance and firm risk taking and loan spreads would be an interesting research topic.

Free-riding, first mover disadvantage, and fear of attracting nuisance suits are the main concerns hindering the disclosure of D&O details. However, countries where the disclosure is mandatory overcame these issues. Generally, my study supports the idea that D&O insurance information is valuable for outside investors in assessing the quality of corporate governance structures, and that legislators around the world should consider requiring the disclosure of this piece of information.

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APPENDIX A. Variable definitions

Table 16: Variable definitions

VARIABLE	DEFINITION
Panel A: Insurance and corporate governance index information	
Insurance (1/0)	Equals one if a firm has purchased D&O insurance; zero otherwise
Insurance coverage	The coverage limit of the D&O insurance policy in millions of Canadian dollars (C$mm)
Insurance coverage ratio	Personal coverage limit of the D&O insurance policy scaled by the firm's average market value of equity in a year
Insurance premium	Annual D&O insurance premium in Canadian dollars (C$)
Per dollar premium	Total annual insurance premium/(effective coverage limit) x (market capitalization)
BSCI index	Academic corporate governance index evaluating the quality of firms governance structures
GMI index	Commercial corporate governance index evaluating the quality of firms governance structures
Panel B: Acquisition outcomes	
CAR (-2, +2) (%)	Five-day cumulative abnormal return calculated using a market model estimated over the period [-210,-11] relative to the acquisition announcement date (day 0)
Acquisition premium_4w (%)	[(Offer price/target stock price 4 weeks prior to announcement)-1] x 100
Panel C: Deal characteristics	
Private target (1/0)	Equals one when the target is a private firm; zero otherwise
Subsidiary target (1/0)	Equals one when the target is a subsidiary; zero otherwise
All-cash deal (1/0)	Equals one for deals financed only by cash; zero otherwise
Stock deal (1/0)	Equals one for deals that are at least partially financed by stock; zero otherwise
Friendly deal (1/0)	Equals one for deals that are listed as friendly in SDC database; zero for hostile takeovers
Unrelated deal (1/0)	Equals one for deals in which the acquirer and the target do not have the same two-digit SIC industry code; zero otherwise
High tech (1/0)	Equals one if the acquirer and target are both from high tech industries defined Loughran and Ritter (2004); zero otherwise
Relative deal size	Deal value (from SDC) over acquirer market value of equity

Panel D: Acquirer characteristics	
Cross-listed (1/0)	Equals one for firms that are cross-listed in Toronto Stock Exchange (TSX) and one of the US stock exchanges (NYSE, Amex, or Nasdaq); zero for firms listed only in TSX
Log(assets)	Natural log of book value of total assets in the fiscal year prior to acquisition announcement
Market-to-book	(Fiscal-year-end market value of equity + book value of liabilities)/total assets in the fiscal year prior to acquisition announcement, winsorized at the $1^{st}/99^{th}$ percentiles
Leverage	(Long-term debt + debt in current liabilities)/(fiscal-year end market value of equity + book value of liabilities) in the fiscal year prior to acquisition announcement
Tobin's *q*	Market value of assets over book value of assets
FCF	Free cash flow: (Operating income before depreciation - interest expense - income taxes - capital expenditure)/book value of total assets in the fiscal year prior to announcement, winsorized at the $1^{st}/99^{th}$ percentiles
Stock price run-up (%)	Acquirer's buy-and-hold return during the [-210,-11] window minus the buy-and-hold return for the TSE 300 Index over the same period

APPENDIX B. Acquisitions by announcement year

Table 17: Acquisitions by announcement year: Total sample

The sample consists of 2,238 completed acquisitions made by firms that were listed in the Toronto Stock Exchange between 2003 and 2013, subject to the availability of D&O insurance and stock price information. The numbers in parentheses are medians. C$mm is millions of Canadian dollars. Absolute dollar values are expressed in real terms (2003 Canadian dollars) and calculated using the Bank of Canada inflation calculator. Relative size is defined in Appendix A.

Year	No. Of acquisitions	Percentage of sample	Mean acquirer market value of equity [C$mm] [Median]	Mean deal value [Median]	Mean relative deal size [Median]
2003	126	5.6	1,467	103	0.34
			[491]	[21]	[0.05]
2004	163	7.3	1,213	178	0.66
			[280]	[47]	[0.11]
2005	203	9.1	1,363	174	0.45
			[384]	[24]	[0.09]
2006	199	8.9	1,722	235	0.84
			[406]	[25]	[0.10]
2007	256	11.4	2,034	203	0.32
			[406]	[24]	[0.09]
2008	225	10.1	3,450	188	0.52
			[421]	[29]	[0.05]
2009	203	9.1	3,914	211	0.32
			[554]	[36]	[0.08]
2010	233	10.4	2,520	151	0.82
			[316]	[37]	[0.12]
2011	238	10.6	2,306	139	1.07
			[436]	[50]	[0.11]
2012	185	8.3	3,611	267	0.32
			[763]	[69]	[0.09]
2013	207	9.2	1,838	177	0.31
			[501]	[28]	[0.08]
Total	2238	100.0	2,358	186	0.54
			[463]	[38]	[0.09]

APPENDIX C. Summary statistics

Table 18: Summary statistics: Total sample

This table presents univariate statistics for 2,338 completed acquisitions made by firms listed in the Toronto Stock Exchange (TSX) between 2003 and 2013, subject to the availability of D&O insurance and stock price information, and the existence of the insurance. The table reports averages of acquirer abnormal announcement returns, acquisitions premiums, and deal and acquirer characteristics for subsamples based on cross-listing status. p-values are from two-tailed t-tests. *,**,***: statistically significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively. Variable definitions are in Appendix A.

			Percentiles			
Variable	Mean	Std. dev	25th	50th	75th	*N*
D&O insurance variable						
Insurance (1/0)	0.717	0.451	0.000	1.000	1.000	2238
Insurance coverage (C$mm)	32.457	51.503	0.000	20.000	40.000	2048
Insurance coverage ratio	0.106	0.799	0.000	0.020	0.076	2001
Acquirer return						
CAR (-2,+2) (%)	0.686	7.318	-2.438	0.248	3.265	2238
Acquisition premiums						
Acquisition premium_4w (%)	38.635	59.903	14.860	31.300	52.940	249
Deal characteristics						
All-cash deal (1/0)	0.181	0.385	0.000	0.000	0.000	2238
Stock deal (1/0)	0.209	0.406	0.000	0.000	0.000	2238
Friendly deal (1/0)	0.983	0.129	1.000	1.000	1.000	2238
Relative size	0.545	2.109	0.026	0.088	0.304	1461
Unrelated deal (1/0)	0.380	0.486	0.000	0.000	1.000	2238
Private target (1/0)	0.508	0.500	0.000	1.000	1.000	2238
Public target (1/0)	0.143	0.350	0.000	0.000	0.000	2238
Subsidiary target (1/0)	0.329	0.470	0.000	0.000	1.000	2238
High tech (1/0)	0.126	0.331	0.000	0.000	0.000	2238
Acquirer characteristics						
Log(assets)	13.356	2.032	12.219	13.341	14.585	2186
Market-to-book	1.758	4.373	0.860	1.490	2.210	2069
Leverage	29.204	25.222	4.315	27.350	47.970	2216
Tobin's q	1.803	1.832	1.115	1.391	1.907	2170
Stock price run-up (%)	0.047	0.433	-0.169	0.008	0.191	2238
Free cash flow	-0.030	0.237	-0.074	0.020	0.075	2043

APPENDIX D. Univariate analysis: Insurance indicator

Table 19: Univariate analysis of D&O insurance purchase

This table presents univariate statistics for 2,238 completed acquisitions made by firms listed in the Toronto Stock Exchange (TSX) between 2003 and 2013, subject to the availability of D&O insurance and stock price information. The table reports averages of acquirer abnormal announcement returns, acquisitions premiums, and deal and acquirer characteristics for subsamples based on the insurance purchase decision. Firms that are listed only in TSX are the non-cross-listed group (Panel B) and firms that are cross-listed in one of the US stock exchanges (NYSE, Amex, or Nasdaq) are the cross-listed group (Panel A). *p*-values are from two-tailed t-tests. *,**,***: statistically significantly different from zero at the 0.10, 0.05, and 0.01 level, respectively. Variable definitions are in Appendix A.

Panel A: Cross-listed firms

	Firms without D&O insurance		Firms with D&O insurance			
Variable	Mean	N	Mean	N	Difference	*p*-value
Acquirer return						
CAR (-2,+2) (%)	0.303	105	0.616	531	-0.314	0.67
Acquisition premiums						
Acquisition premium_4w (%)	26.260	22	50.930	60	-24.670*	0.06
Deal characteristics						
All-cash deal (1/0)	0.190	105	0.220	531	-0.030	0.48
Stock deal (1/0)	0.238	105	0.168	531	0.070	0.12
Relative size	0.283	73	0.249	315	0.034	0.70
Unrelated deal (1/0)	0.200	105	0.328	531	-0.128***	0.00
Private target (1/0)	0.419	105	0.444	531	-0.025	0.63
Public target (1/0)	0.124	105	0.205	531	-0.081**	0.03
Subsidiary target (1/0)	0.419	105	0.331	531	0.088*	0.10
High tech (1/0)	0.219	105	0.209	531	0.010	0.82

Panel B: Non-cross-listed firms

	Firms without D&O insurance		Firms with D&O			
Variable	Mean	N	Mean	N	Difference	*p*-value
Acquirer return						
CAR (-2,+2) (%)	1.169	529	0.521	1073	0.649	0.13
Acquisition premiums						
Acquisition premium_4w (%)	37.018	74	34.916	93	2.101	0.77
Deal characteristics						
All-cash deal (1/0)	0.136	529	0.184	1073	-0.047***	0.01
Stock deal (1/0)	0.314	529	0.174	1073	0.140***	0.00
Relative size	0.909	376	0.416	696	0.492***	0.00
Unrelated deal (1/0)	0.287	529	0.470	1073	-0.182***	0.00
Private target (1/0)	0.478	529	0.562	1073	-0.084***	0.00
Public target (1/0)	0.170	529	0.101	1073	0.069***	0.00
Subsidiary target (1/0)	0.325	529	0.321	1073	0.005	0.86
High tech (1/0)	0.057	529	0.109	1073	-0.052***	0.00

APPENDIX E. Industry compositions

Figure 3: Industry composition of cross-listed acquirers

Figure 3 presents industry composition for cross-listed acquirers included in the study based on 12 Fama-French industry groups. The sample consists of 454 completed acquisitions made by firms that are listed in the Toronto Stock Exchange and cross-listed in one of the US stock exchanges (NYSE, Amex, or Nasdaq). See French's website (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\ library.html) for industry definitions.

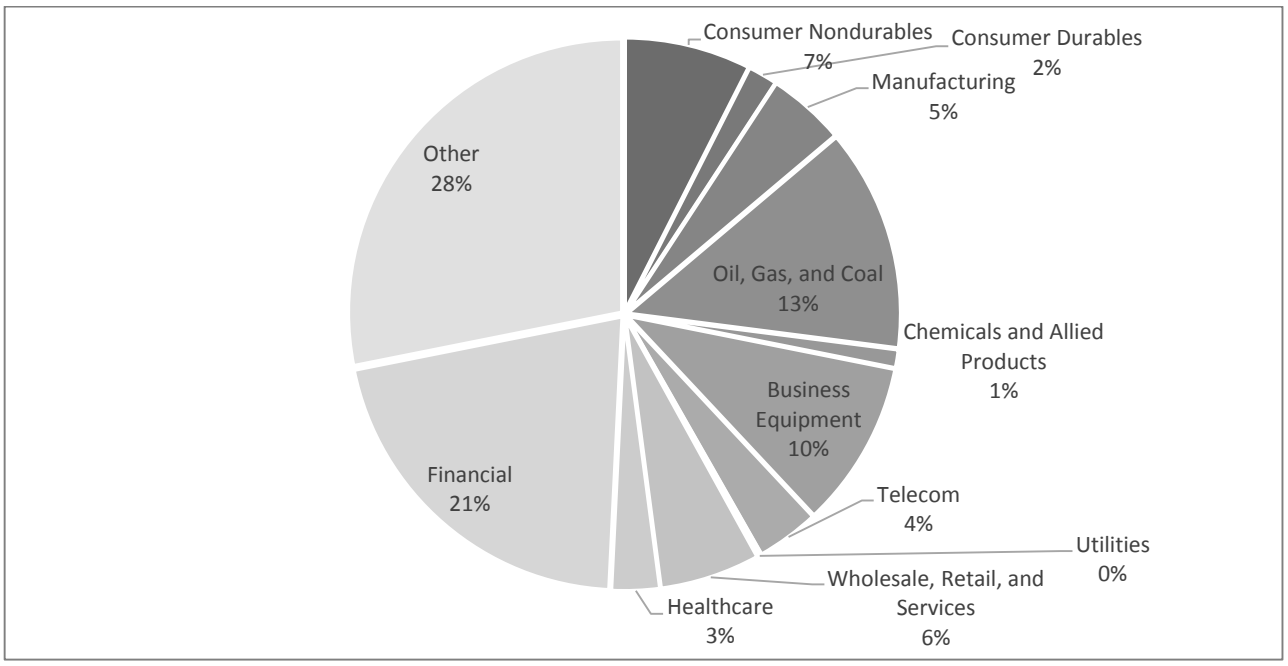

Figure 4: Industry composition of non-cross-listed acquirers

Figure 4 presents industry composition for non-cross-listed acquirers included in the study based on 12 Fama-French industry groups. The sample consists of 914 completed acquisitions made by firms that are listed in the Toronto Stock Exchange. See French's website (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\ library.html) for industry definitions.